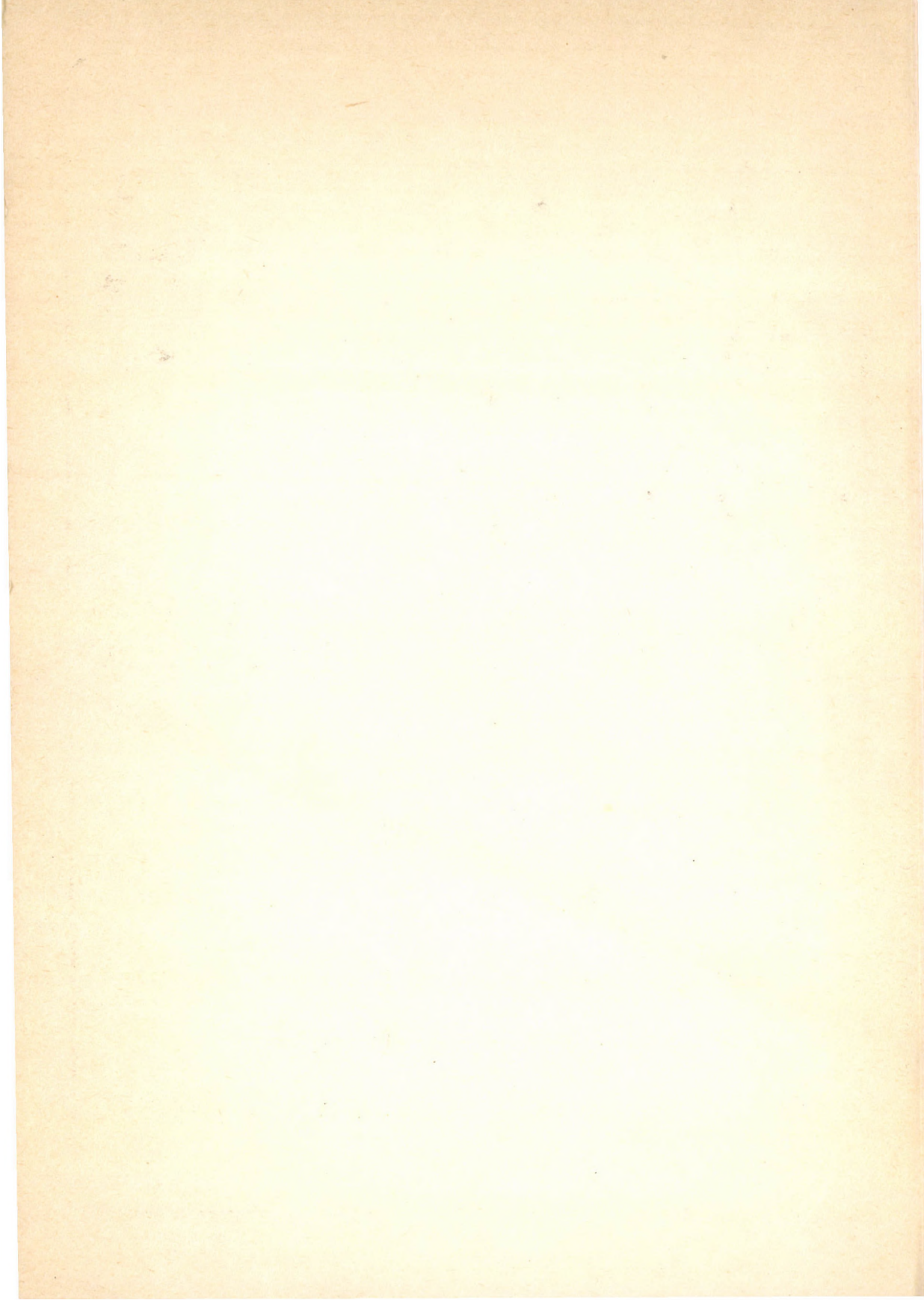


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**A PHONETIC
CONSPECTUS
OF POLISH**

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K. BOLLA – É. FÖLDI

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**The articulatory and acoustic features
of Polish speech sounds**

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 Cechy artykulacyjne i akustyczne dźwięków mowy języka
 polskiego

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Preface

This phonetic conspectus of Polish, supplemented with an articulatory data base compiled by computer from the results of some related phonetic experiments, and presented here as Volume 18 of Hungarian Papers in Phonetics, summarizes the outcome of a recent stage in our general project for interlingual phonetic comparisons. As was reported earlier (MFF 9. 1981, p. 7), we are currently engaged in a major project for the complex phonetic investigation of several structurally related and unrelated languages (Hungarian, Finnish, Russian, Polish, British English, American English, German, and French) conducted in a unified framework and with constant methodology, in order to obtain a reliable basis for phonetic research both within and across languages. Our primary objective is a better understanding of the phonetic character and phonological system of Hungarian, and we intend to get closer to that ultimate aim by confronting it with articulatory mechanisms and acoustic characteristics of a number of other languages. The data base obtained from such experimental phonetic analyses of seven or eight languages may also contribute, at a later stage, to typological studies of a more comprehensive sort. The information and materials gathered from interlingual phonetic research can also serve educational purposes: they can be put to good use in university courses in phonetics (in Hungarian and general phonetics courses as well as in those in the other languages involved), in speech cultivation, and other areas of applied phonetics.

This conspectus describes Polish speech sounds, rather than the phonemes of Polish. We have investigated sound types occurring in various phonetic positions, taking the effects of phonetic environment on the quality of speech sounds into consideration. With regard to some controversial issues in the literature on the sound pattern of Polish, we have included e.g. two types of palatalized consonants, indicated in transcription by ' and " , respectively (C' = palatalized consonant before [i], C" = palatalized consonant

before a vowel other than [i]). We think the material in this conspectus will help decide in each case whether we have a palatalized consonant or a consonant cluster whose second member is [j]. Similarly, we have included nasalized vowels, as well as vowels in palatalized environments, for the same reason. The authors thus do not consider the phonetic (let alone phonological) status of the ninety-two sound segments investigated to be uncontroversially established.

The cineradiographic recordings underlying the material presented here have been made in the Radiological Clinic of the Semmelweis Medical University, Budapest, with the helpful consent of the director of the clinic and Dr. Ernő Makó's generous co-operation. We wish to express our thanks to both of them.

The experiments and instrumental analyses involved in the investigation of the phonetic properties of Polish speech sounds have been conducted in the phonetic laboratories of the Linguistics Institute of the Hungarian Academy of Sciences and of the Phonetics Department at the Faculty of Arts of Eötvös Loránd University, Budapest. We are grateful to all colleagues at both laboratories for their co-operation.

Acknowledgements are also due to the native informants participating in the phonetic experiments, Romuald Cudak, Joanna Joasińska-Bene, and Wiesław Starowicz for kindly undertaking this tiring and often uncomfortable task.

Finally, a word of thanks should go to the Director of the Linguistics Institute of HAS for making the publication of this book possible, and to the staff of HAS Mimeographic Services for their technical assistance in producing it.

We sincerely wish that linguists, phoneticians, students and teachers of Polish, and all other readers interested in the phonetic structure of Polish speech should find this book worth consulting.

The authors

INTRODUCTORY REMARKS

1. On the use and purpose of the conspectus

The articulatory and acoustic properties of Polish speech sounds have been described in a number of excellent studies in the Polish literature. Two of these deserve special mention here: Benni's 1923 phonetics textbook, illustrated by Abiński's schematic diagrams of articulatory positions, and Koneczna and Zawadowski's *Obrazy rentgenograficzne głosek polskich* (1951). However, conspectus-type presentations of Polish speech sounds, summarizing the results of complex and exact instrumental investigations, have not been published so far.

The present conspectus highlights the dynamic aspects of phonetic research.

It is exactly by means of its structural complexity that the extremely highly articulated sound shape of human language is capable of expressing an infinitely large number of communicative intentions, even the most complicated and intricate, in an economical manner. Although the individual configurations of sounds as materialized in spoken utterances are unique and non-recurrent, their structural constituents are taken from a finite set of types and obey explorable and definable regularities based on the given linguistic code as they are organized into sound sequences of varying length, expressing linguistic signs and structures. The sound shape of the speech continuum involves basically two types of structure, segmental and supra-segmental. The elementary units of segmental structure are linguistically-interpreted sections of the continuum known as speech sounds, i.e. the material realizations of the phonemes of the language in question. Within suprasegmental structure, factors of timing, melody, relative intensity (or dynamics), and phonation/timbre are organized into larger sequential units.

Based on linguistic patterns, the sound shapes embodied in the speech flow are produced by typical movements of various organs, or kinetic stereotypes. Such typical movements of the speech organs generate types of oscillations continually changing their frequency spectra and intensity values as a function of time (of articulation), i.e. oscillational stereotypes in which structures of constitutive and differentiative features of sound shapes can be found but which are also characterized

by a considerable amount of redundancy.

This conspectus presents the major articulatory and acoustic properties of Polish speech sounds (segmented from word-size chunks of phonetic material), arranged in tableaux, diagrams, photograms, and tables of numerical data.

Another important question we have to discuss briefly is whether the pronunciation of one -- or a few -- selected native speaker(s) can be taken to represent what is phonetically typical, functionally important and linguistically relevant, whether the speech of the person(s) taking part in these experiments reflects -- and if it does, to what extent -- the conventional and general aspects of what there is, mostly intuitively, in the collective consciousness of the speech community.

The history of experimental phonetic research, its results and their subsequent reception have shown that this is possible if the investigations are carried out with care and expertise, using methods and instruments that meet the technical requirements of the day. On the other hand, it has to be pointed out that the language under scrutiny is always richer and more complex in its actual reality than what can be captured of it by experimental techniques and various forms of visual display.

The subject-matter and purpose of research into the sound shape of Polish speech involve more than what is now presented in the plates and tables of this conspectus as a result of so-called objective (instrumental) investigations. An account of sequential and suprasegmental characteristics is beyond the scope of the present work: a phonological interpretation of the sound pattern of Polish, on the other hand, would require an entirely different approach. Still, the diagrams included here give a faithful and objective representation of articulatory and acoustic properties of Polish speech sounds. The information given in Plate 0, and the calibrations of subsequent spectrograms, provide further help for the user of this phonetic conspectus.

2. Experimentees, native speakers in the phonetic experiments

We have conducted a complex phonetic investigation of Polish speech sounds with the participation of three native speakers, two male and one female. This conspectus contains the data and articulatory and acoustic diagrams

obtained from a male informant identified as 'St'. Since Polish pronunciation cannot be considered completely homogeneous, we have made detailed observations of particular phonetic phenomena by producing sound recordings and diagrams of the speech of other persons -- obviously, all of them native speakers of Polish -- but the results of these subsidiary investigations are not included in this conspectus. The results of articulatory and acoustic investigations of sixty Polish speech sounds based on the pronunciation of a male informant identified as 'Cu' has been published in three earlier papers (cf. Bolla--Földi MFF 7. 1981, 91--155 and MFF 8. 1981, 104--46).

The informant of the present conspectus, Wiesław Starowicz, was born in 1958 in Katowice. After finishing secondary school, he studied Hungarian and Finno-Ugristics at the Kossuth Lajos University of Debrecen, Hungary. At present he lives in Budapest and works as an interpreter. He was very cooperative during the phonetic experiments. His vocal organs function normally: he is an experienced speaker whose pronunciation corresponds to the norms of Standard Polish. In his well-cultivated speech, no dialectal or (non-standard) idiolectal features can be detected. In addition to his mother tongue, he speaks Hungarian and Russian.

3. The linguistic corpus of the phonetic experiments

The experimental phonetic research reported on here constitutes part of a larger project for interlingual comparisons. Therefore, it was reasonable and expedient to compile the linguistic corpus in accordance with pre-established criteria.

For the purposes of the investigation of articulatory and acoustic properties, we first compiled a bulky corpus of words, representative of the various phonetic environments. This corpus was recorded on tape, pronounced by the informants as one-word sentences. Then, largely by auditory analysis, we selected a set of samples significantly representing the basic realizational types of Polish speech sounds. This 'minimized' set of samples then served as the linguistic corpus of instrumental investigations. To explore the ways adjacent speech sounds affect one another in connected speech, we also compiled a set of model sentences, including idiomatic phrases and proverbs, that contained the combinations we wanted to analyse. The

total corpus also contains material suitable for investigating suprasegmental structure.

Finally, we asked every informant to read out sample texts of fiction and to produce spontaneous speech to be recorded and used for phonetic observation and analysis. Occasionally we used various further samples and/or repeated recording sessions to obtain as reliable material as possible.

The minimized corpus for instrumental investigation consisted of the following items:

For vowels: tak, tramwaj, dziadzio, niańczyć, kot, kąt,
ciocia, miąć, góra, munsztuk, tiul, triumf,
byk, synteza, bigos, winszuje, bek, gęba, mieć
mięsień, mała, szedł

For consonants: baly, bili, biały, pasek, pili, piasek,
mała, pasm, miś, miała, data, drzewo, dis,
diabeł, taka, trzeba, tik, tiara, napój,
garnka, niby, niania, pieśń, bank, ręki, gada,
gitara, magia, katar, kicz, kiedy, rada, krtań
riposta, malaria, krwi, waga widmo, wiara,
fakt, firma, fiat, zawód, Zanzibar, sama, si-
nus, żadne, żigolo, ziarno, szachy, kosz jab-
łek, siano, jama, klechda, dach zielony, cha-
ta, chiński, herb, lato, myśl, list, dzban,
car, cibazol, dżonka, dżinsy, dziady, czapka,
Chile, ciasto.

THE DIAGRAMS OF THE SOUND PLATES, ON THE USE OF THE CONSPECTUS

(A description of the symbols, indications, measurement points and calibrations used in the phonetic analysis of the diagrams)

1. The heading of the sound plate

This contains the number of the plate (0--92) which facilitates reference to the plate within the text and makes the book easier to use. Below the number the phonetic symbol of the sound is presented in IPA and Slavic transcription. The word containing the analyzed sound can be seen in IPA and Slavic transcription between square brackets in the lower line, and the orthographic form of the word is given in the upper line.

2. Photolabiogram

This diagram shows the shape of the lips in articulation. The measurement points used indicate:

- 1 -- the opening between the upper and lower lips
- 2 -- the opening between the corners of the lips
- 3 -- the opening of the lower jaw
- (4) -- the horizontal movement of the lower jaw
- (5) -- the extent of lower lip protrusion
- (6) -- the horizontal movement of the upper lip.

3. Dynamic labiogram series

This consists of five photolabiograms taken from our videotaped material and shows how the positions of the lips changes during the articulation of the sound presented. Each section photograph shows a 20 ms period of the articulation.

1. The first picture shows the position of the lips (frontally) in the initial phase,
2. the second at the one quarter time point,
3. the third at the half-time point,
4. the fourth at the three quarter time point, and
5. the fifth in the final phase of articulation.

4. Cineradiogram contours of the pure phase of the sound

The radiograms give information on the articulatory positions of the supraglottal cavities. The large schematic drawing of the radiogram on each plate represents the

so-called "pure phase" of the articulation of the sound in question which was segmented from the dynamic radiograms of words recorded by a videotape recorder. The contours of the supraglottal articulatory organs are provided in schematic drawings because the copying and typographic reproduction of the X-ray film blur the fine differences in shade and consequently observation is difficult. The cineradiogram sections show the position of the articulatory organs in 20 ms periods.

The articulatory organs seen in the schematic drawing on the right hand side of Plate 0 and the articulatory phonetic terms based on them are:

- A -- mouth cavity, oral
- B -- pharyngeal cavity, pharyngeal
- C -- nasal cavity, nasal
- 1 -- upper lip, labial
- 2 -- lower lip, labial } bilabial
- 3 -- upper front teeth, dental
- 4 -- lower front teeth, dental } interdental
- 5 -- alveolar ridge, alveolar
- 6 -- hard palate, palatal
 - a) prepalatum, prepalatal
 - b) mediopalatum, mediopalatal
 - c) postpalatum, postpalatal
- 7 -- soft palate, velar
- 8 -- uvula, uvular
- 9 -- pharyngeal wall, pharyngeal
- 10 -- epiglottis, --
- 11 -- larynx, laryngeal
- 12 -- tongue bone, --
- 13 -- root of the tongue, radical
- 14 -- dorsum, dorsal
 - a) predorsum, predorsal
 - b) mediodorsum, mediodorsal
 - c) postdorsum, postdorsal
- 15 -- tip of the tongue, apical
- 16 -- genial process, --
- 17 -- lower jaw.

In order to make the exact analysis of articulation easier measurement and referential points have been placed on the contours of the articulatory organs. Most of the points serve as measurement points for computer analysis, but some of them (10, 21, 23, 24, 25, 26, 32) are only referential points which make it easier to draw the exact

contours of the articulatory organs.

The figures in the schematic drawing on the left hand side of Plate 0 represent the following articulatory positions:

- 1--11: the opening between the upper and lower lips
- 2--12: the distance between the edge of the upper front teeth and that of the lower front teeth
- 2--10: the closedness/openedness of the jaws
- 2--22: the distance between the apex and the edge of the upper front teeth
- 2--13, 14, 15, 16, 17, 18: the distance between the edge of the upper front teeth and a point of the dorsum which faces the measurement point of the corresponding passive articulatory organ
- 3--22, 13, 14, 15, 16, 17, 18: the distance between the apex, the dorsum, the root of the tongue and the prepalatum
- 4--22, 13, 14, 15, 16, 17, 18: the distance between the apex, the dorsum, the root of the tongue and the mediopalatum
- 5--12, 13, 14, 15, 16, 17, 18: the distance between the apex, the dorsum, the root of the tongue and the palatovelar boundary line
- 6--22, 13, 14, 15, 16, 17, 18: the distance between the measurement points of the tongue and the boundary line between the soft palate and the uvula
- 5--12: the distance between the edge of the lower front teeth and the palatovelar boundary line
- 5--10: the distance between the genial process and the palatovelar boundary line
- 8--30 and 9--29: express nasality
- 12--22, 13, 14, 15, 16, 17, 18: the distance between the edge of the lower front teeth and the measurement points of the tongue
- 10--28: the distance between the genial process and the lower part of the pharyngeal wall
- 28--22, 13, 14, 15, 16, 17, 18: the position of the measurement points of the tongue as compared to the lower part of the pharyngeal wall
- 12--27: the distance between the edge of the lower

- front teeth and the measurement points at the upper part of the pharyngeal wall
- 10--27: the position of the genial process as compared to the upper part of the pharyngeal wall
- 27--22, 13, 14, 15, 16, 17, 18: the distance between the measurement points of the tongue and the measurement point of the upper part of the pharyngeal wall.

5. Schematic cineradiogram series

This consists of five schematic drawings of our videotaped X-ray films and shows articulation in process. The section diagrams represent a 20 ms period of the articulation. The central phase is repeated when the total length of the analyzed sound was shorter than 100 ms.

The first represents the articulatory organs in the initial phase,
the second at the one quarter time point,
the third at the half-time point,
the fourth at the three quarter time point, and
the fifth in the final phase of articulation

6. Photopalatogram

This is provided for identifying the configuration of the articulatory organs, the place and, partly, the manner of articulation. The significant zones are:

- C -- central zone
- L -- lateral zone
 - a -- upper front teeth, dental zone
 - b -- the alveolar ridge, alveolar zone
 - c -- the hard palate, palatal zone
 - d -- the soft palate, velar zone.

7. Photolinguogram

This shows the role of the tongue as an "active" articulatory organ. It is divided by letters into parts which are significant for a description of the phonetic quality of the sound:

- a -- the tip of the tongue (apex), apical
- b -- the front of the upper part of the tongue (predorsum), predorsal
- c -- the centre of the upper part of the tongue (mediodorsum), mediodorsal

- d -- the back of the upper part of the tongue
(postdorsum), postdorsal
- e -- the right and left rims of the tongue (corona),
coronal.

8. Composite oscillographic diagram

Oscillograms provide the graphic image of sound vibration. The oscillographic diagram on each sound plate consists of three curves: these show the specific vibration form of the sound presented.

The middle curve includes all the acoustic components of the sound and shows their changes through the entire length of articulation. The sample (sometimes two samples) above it is an enlargement of a segment delimited on the upper curve, and is provided to make finer analysis possible.

The lower curve is the glottographic representation of the sound: it shows the vibrations of the vocal cord, i.e., the vibration form of the voice produced in the larynx. The ascending part of the curve corresponds to the opening phase of the vocal cord, the descending part to the closing phase.

Amplitude size in the three oscillograms is not an absolutely precise indicator of real physical intensity, because intensification has been occasionally made to increase the demonstrative power of the presentation.

In the case of longer sounds the whole oscillogram could not be accommodated in the picture-size available and segments have been cut out for presentation, primarily from periods during which the curve was relatively steady. The cuts are indicated by broken lines.

9. Dynamic spectrograms and amplitude sections

The dynamic spectrogram shows the acoustic changes which determine sound quality, primarily the changes in all component frequencies of the complex vibration and, approximately, the intensities of the complex frequencies, during the entire length of articulation. Two spectrograms are given for each sound. The first one, the so-called broad-band analysis, is used to determine the formant structure and the fundamental frequency, while the narrow-band analysis produces a more detailed spectrogram which lends itself to a minute analysis of the harmonics and the noise structure.

The frequency and temporal data of the spectrogram

can be determined by the help of the calibration on the diagram. The measure of intensity can be seen from the degree of blackening and from the force with which the components appear. (The sensation of loudness can be determined only through the co-operation of other factors -- e.g. frequency and duration.)

The amplitude section furnishes the frequency and relative intensity data of the spectrum over a period of 8 ms in the so-called pure phase of articulation. A broad-band and narrow-band amplitude section is given for each sound, showing the frequency and intensity properties of the so-called pure phase.

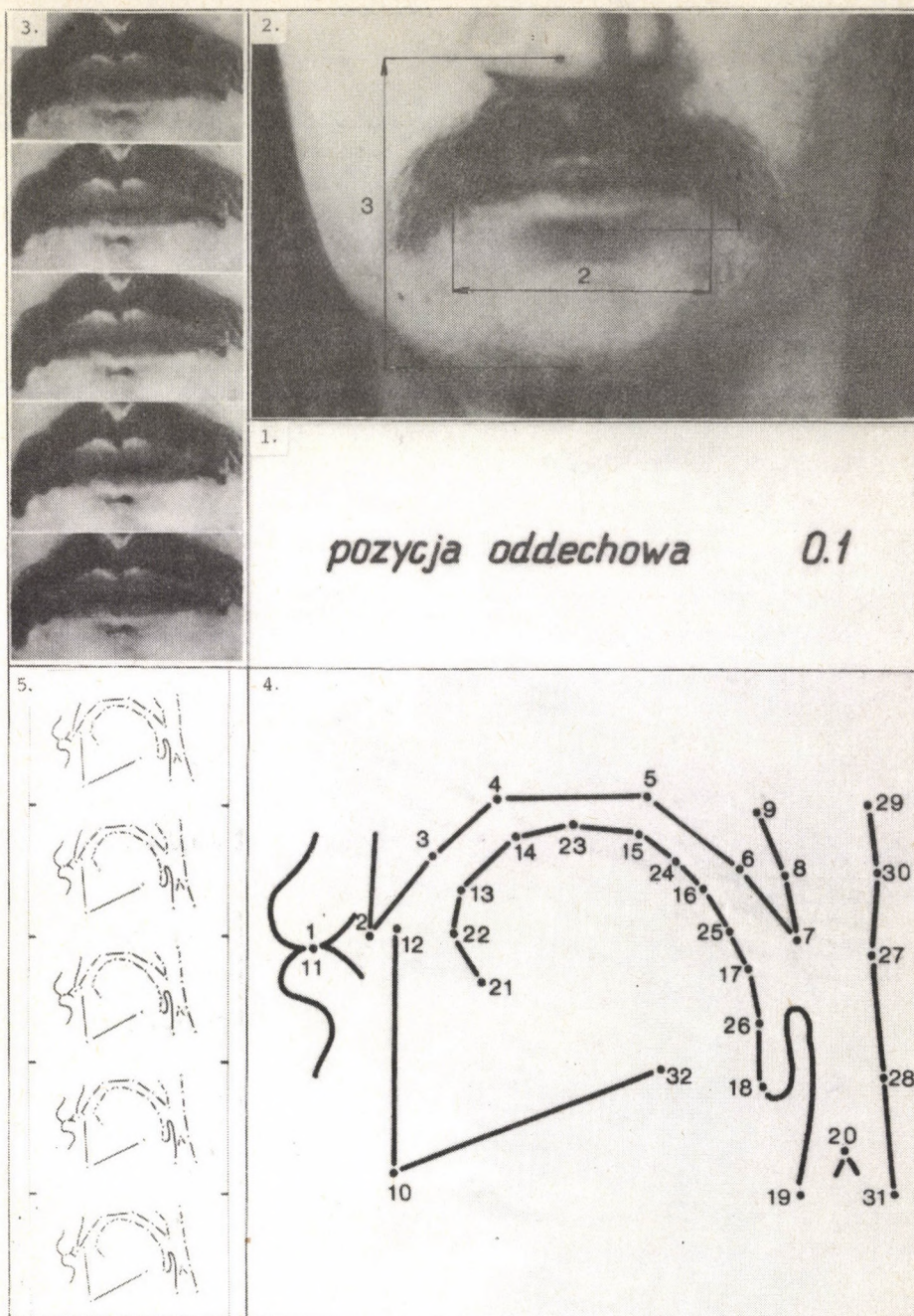
Vowels are analyzed in a frequency range below 5 kHz, and consonants below 8 kHz, in terms of the calibration on the diagram.

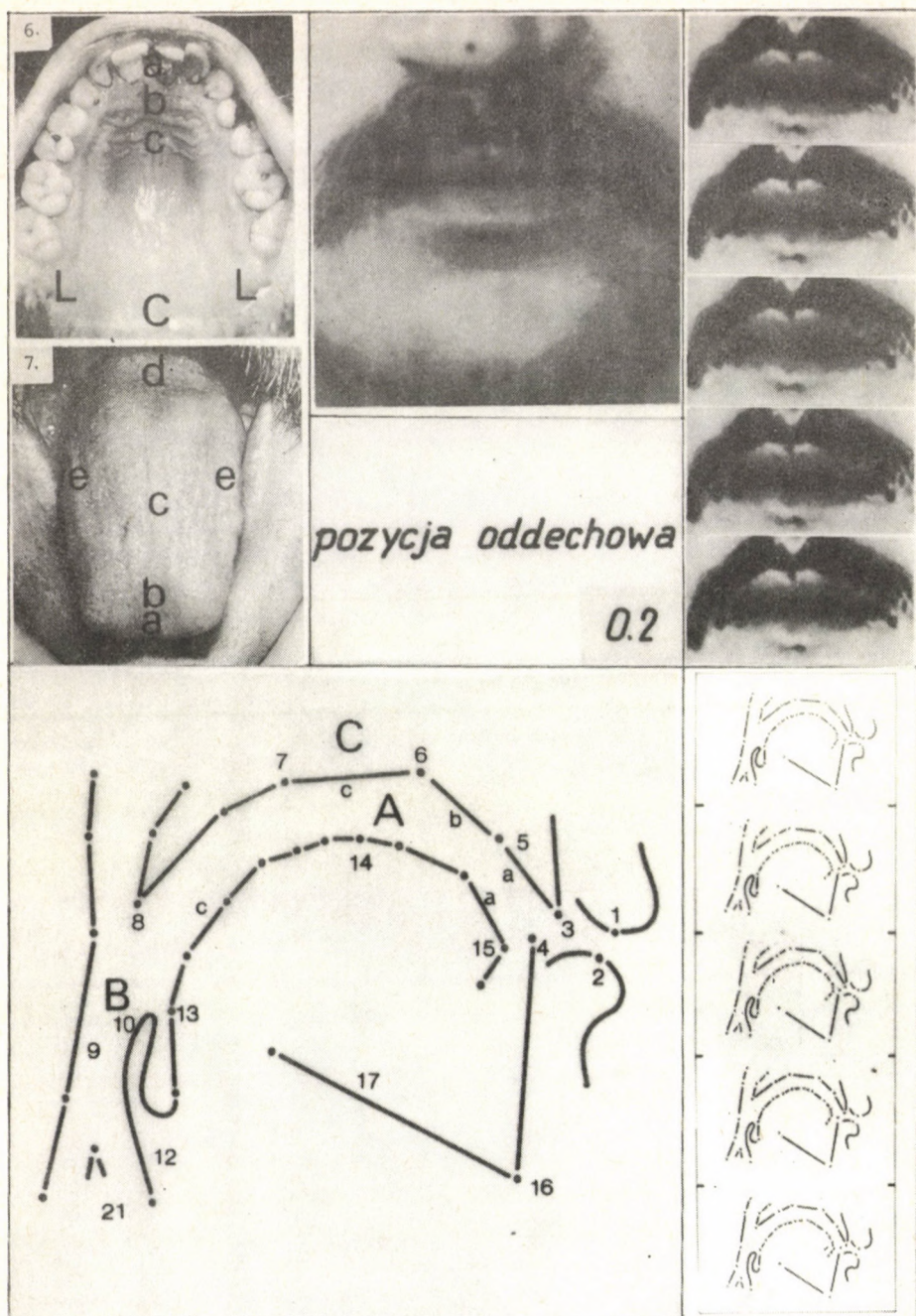
ARTICULATORY AND ACOUSTIC DIAGRAMS OF POLISH SPEECH SOUNDS

DIAGRAMY ARTYKULACYJNE I AKUSTYCZNE DŹWIĘKÓW MOWY JĘZYKA
POLSKIEGO

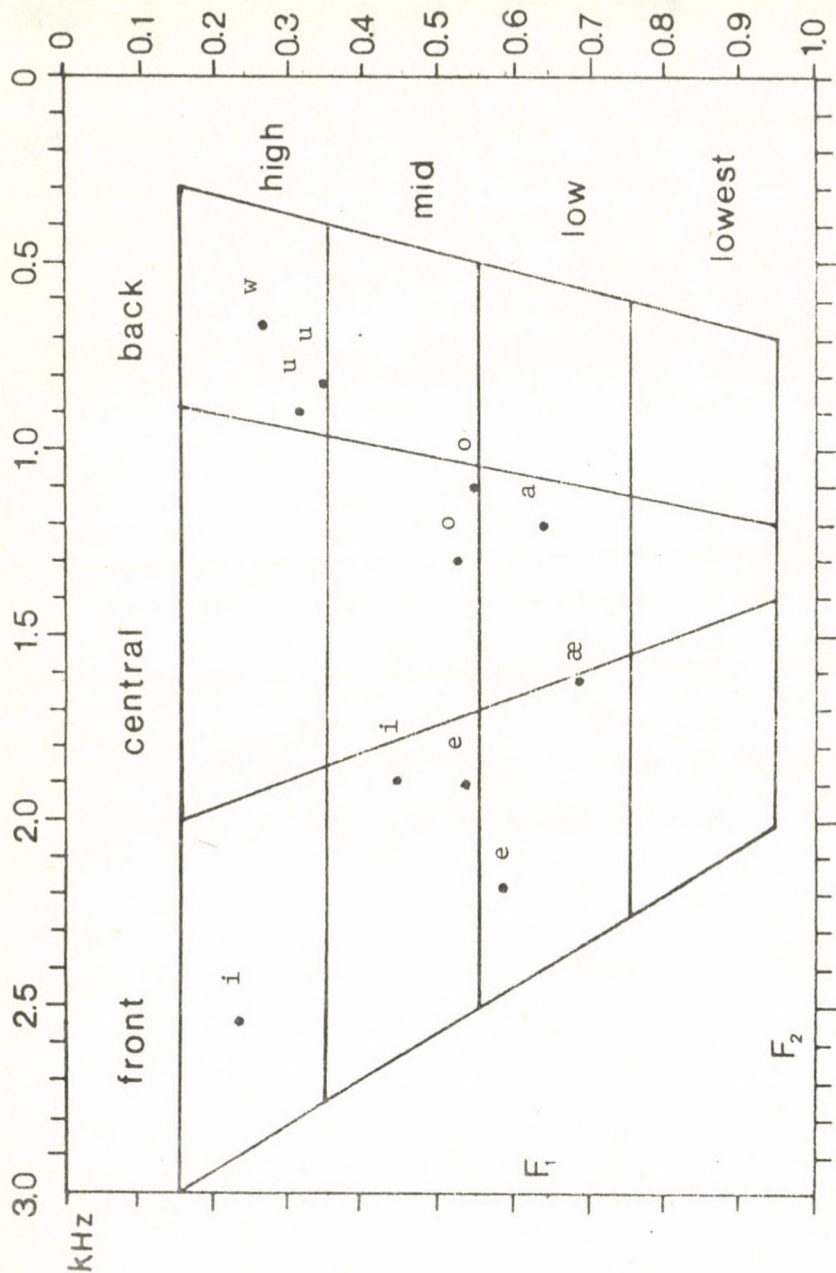
The rest position of the articulatory organs

Stan spoczynku narządów mowy

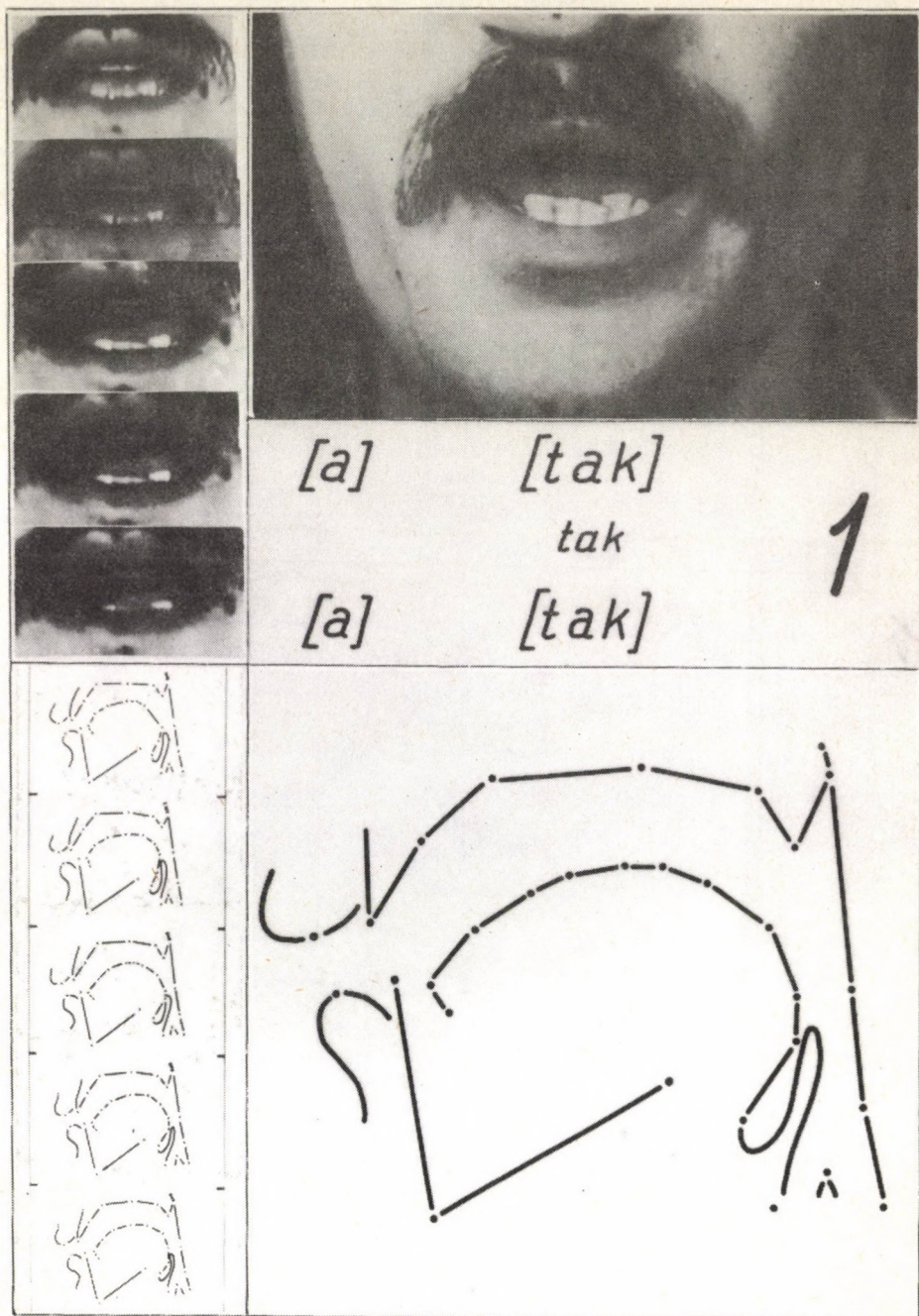


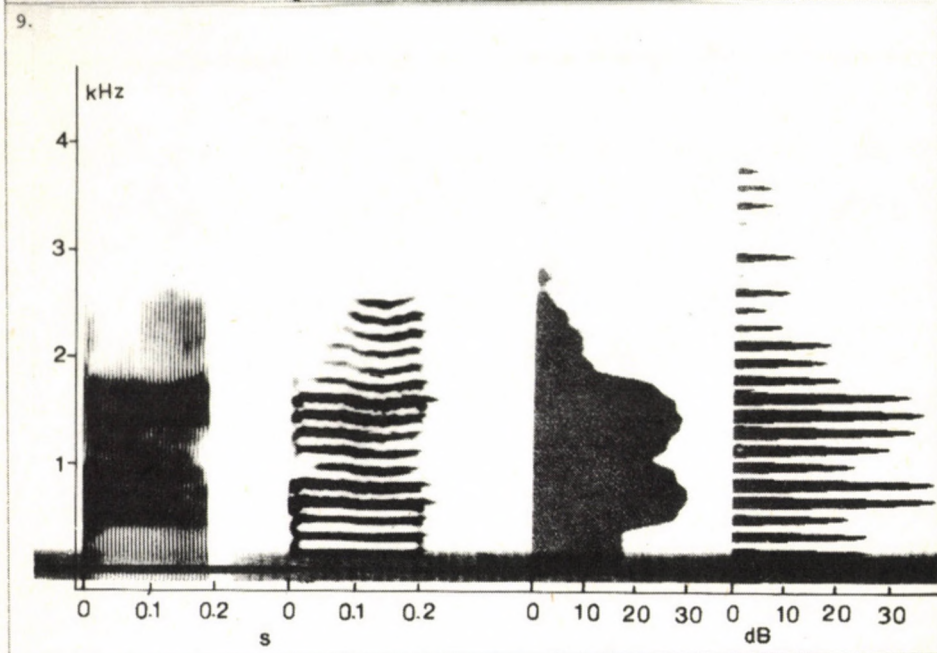
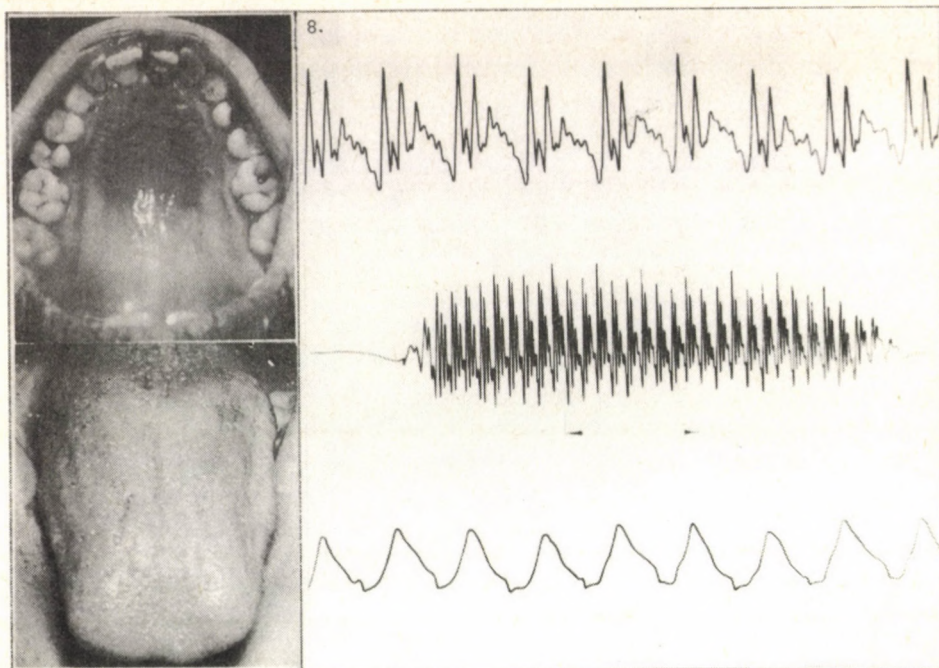


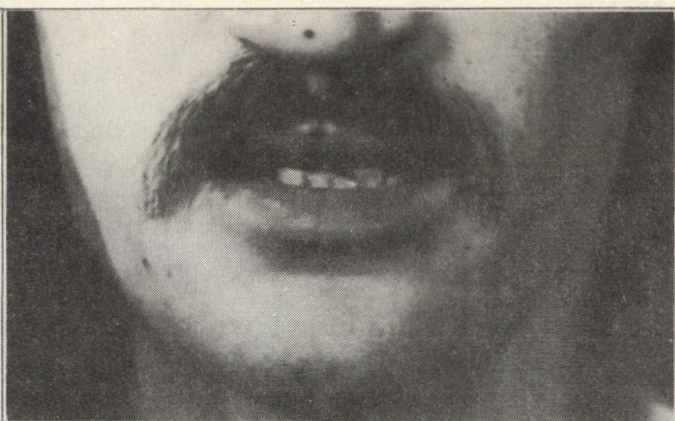
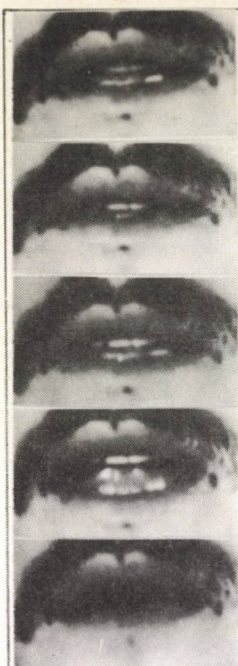
1. Vowels / Samogłoski



The classification of Polish vowels according to their articulatory features and F₁, F₂





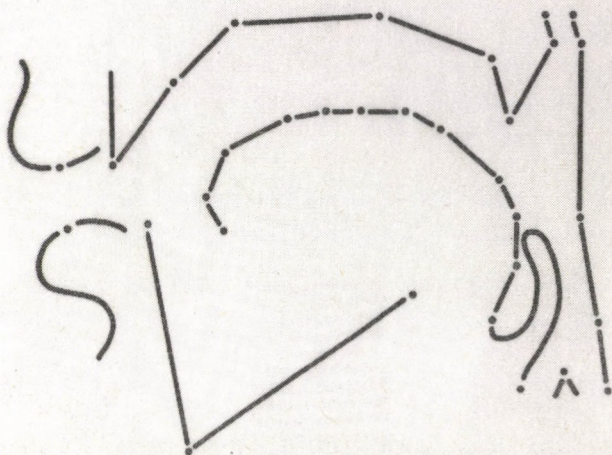
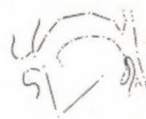


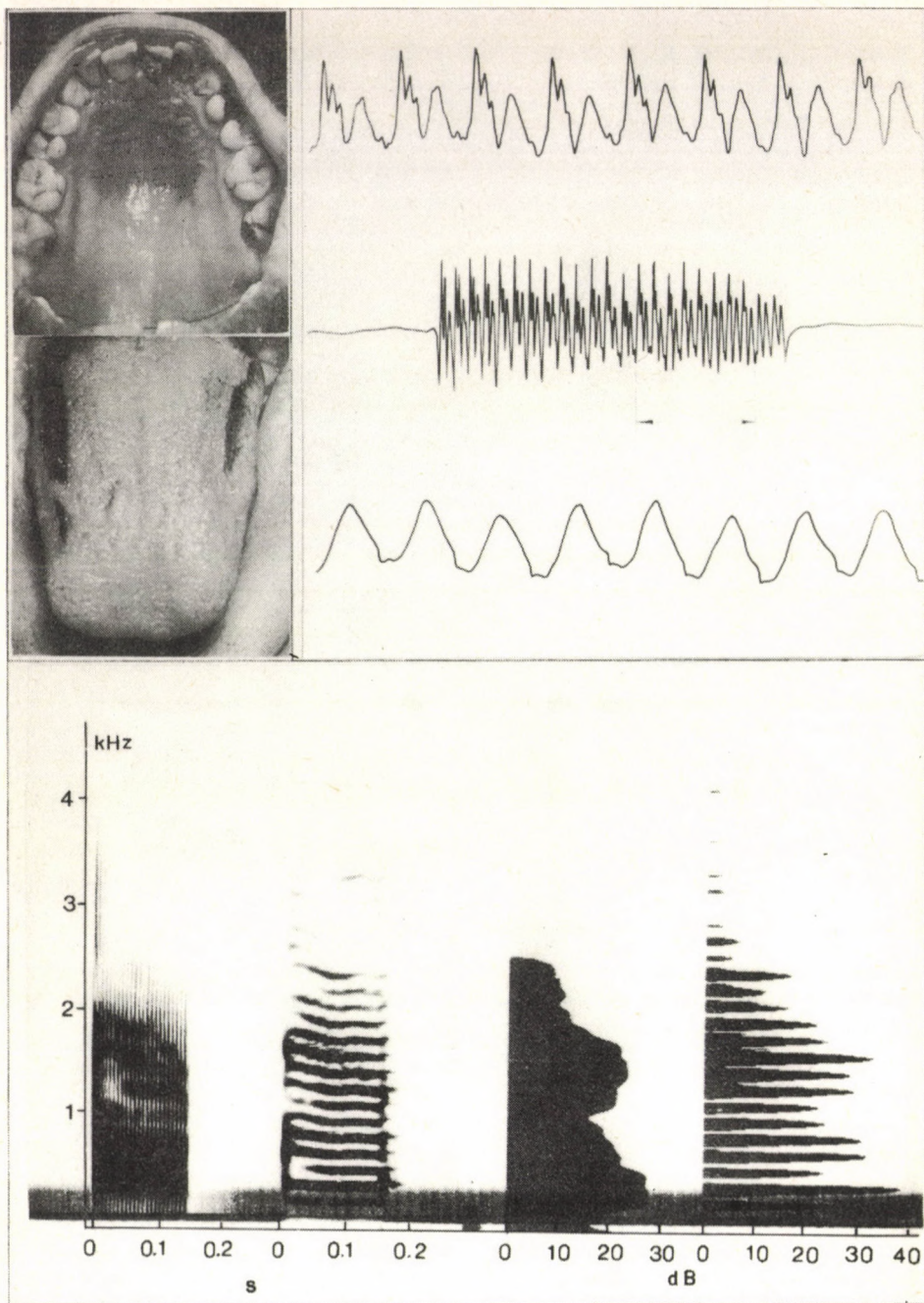
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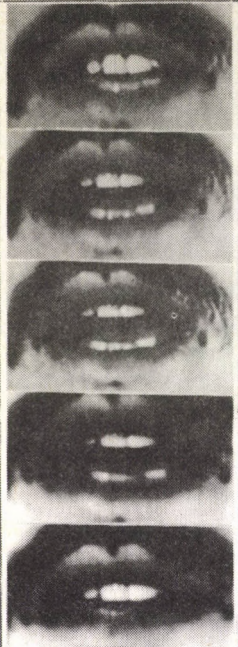
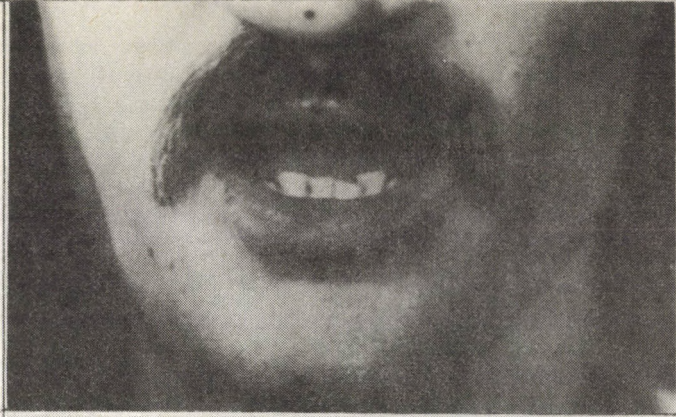

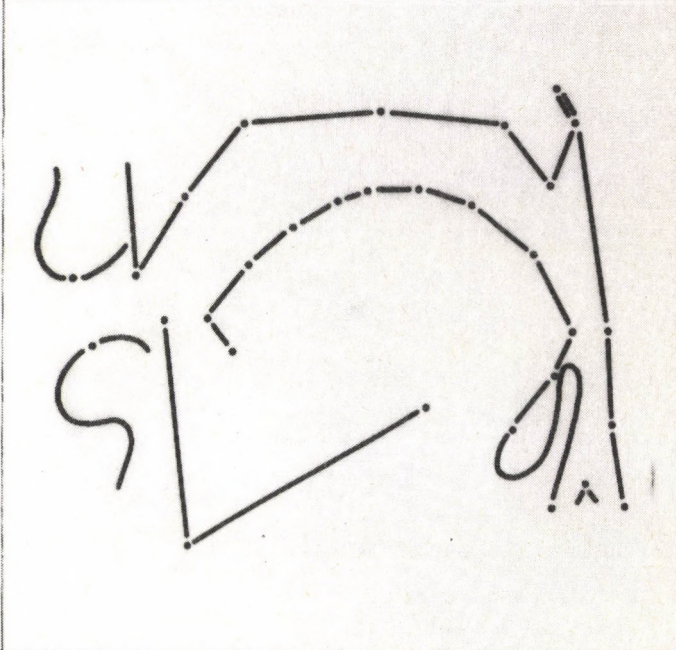
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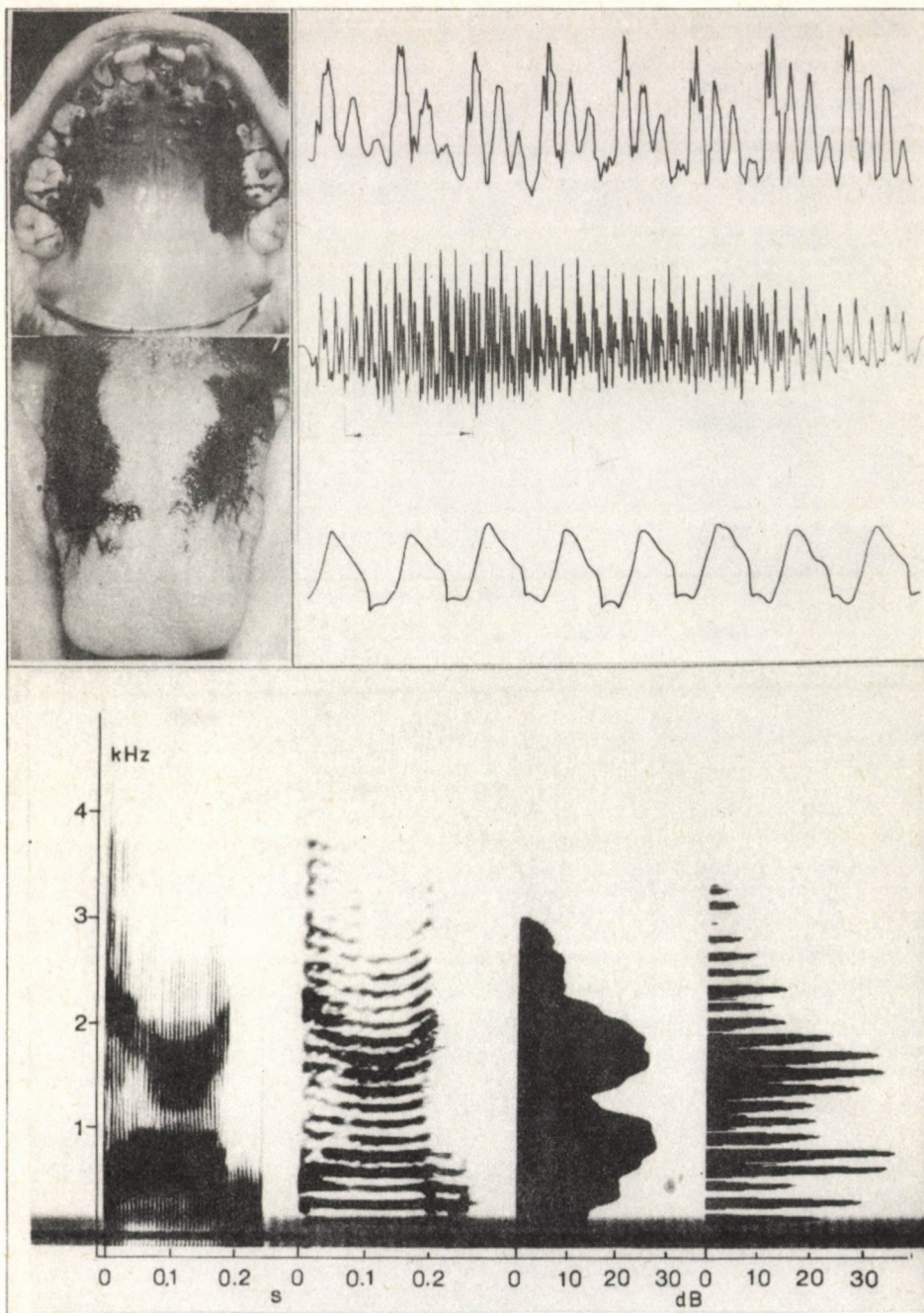
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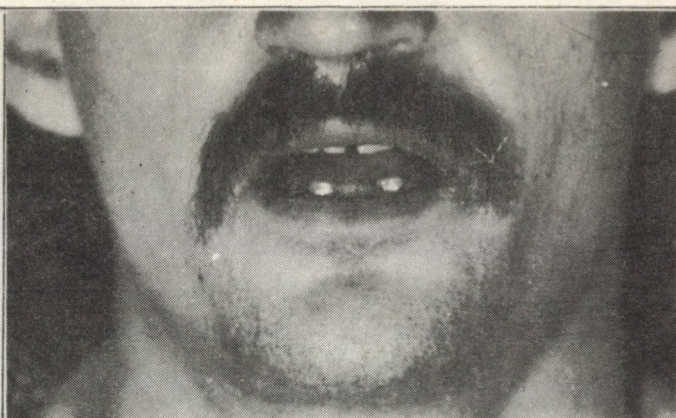
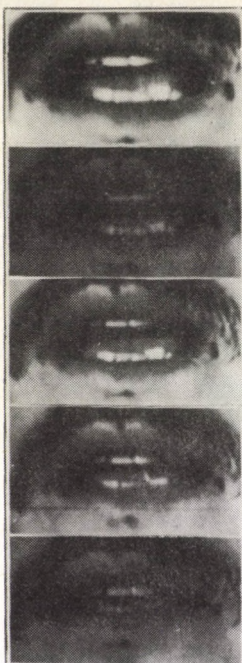
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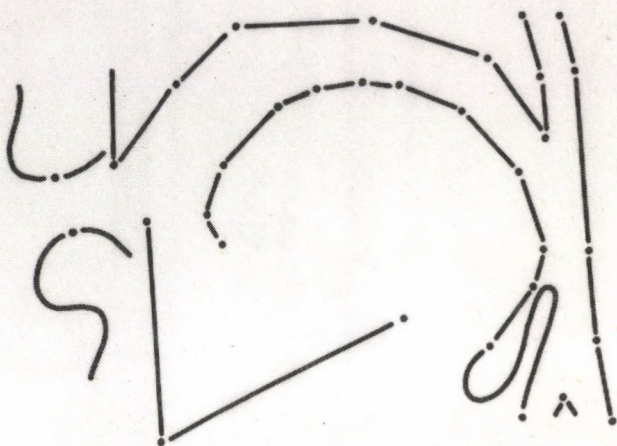


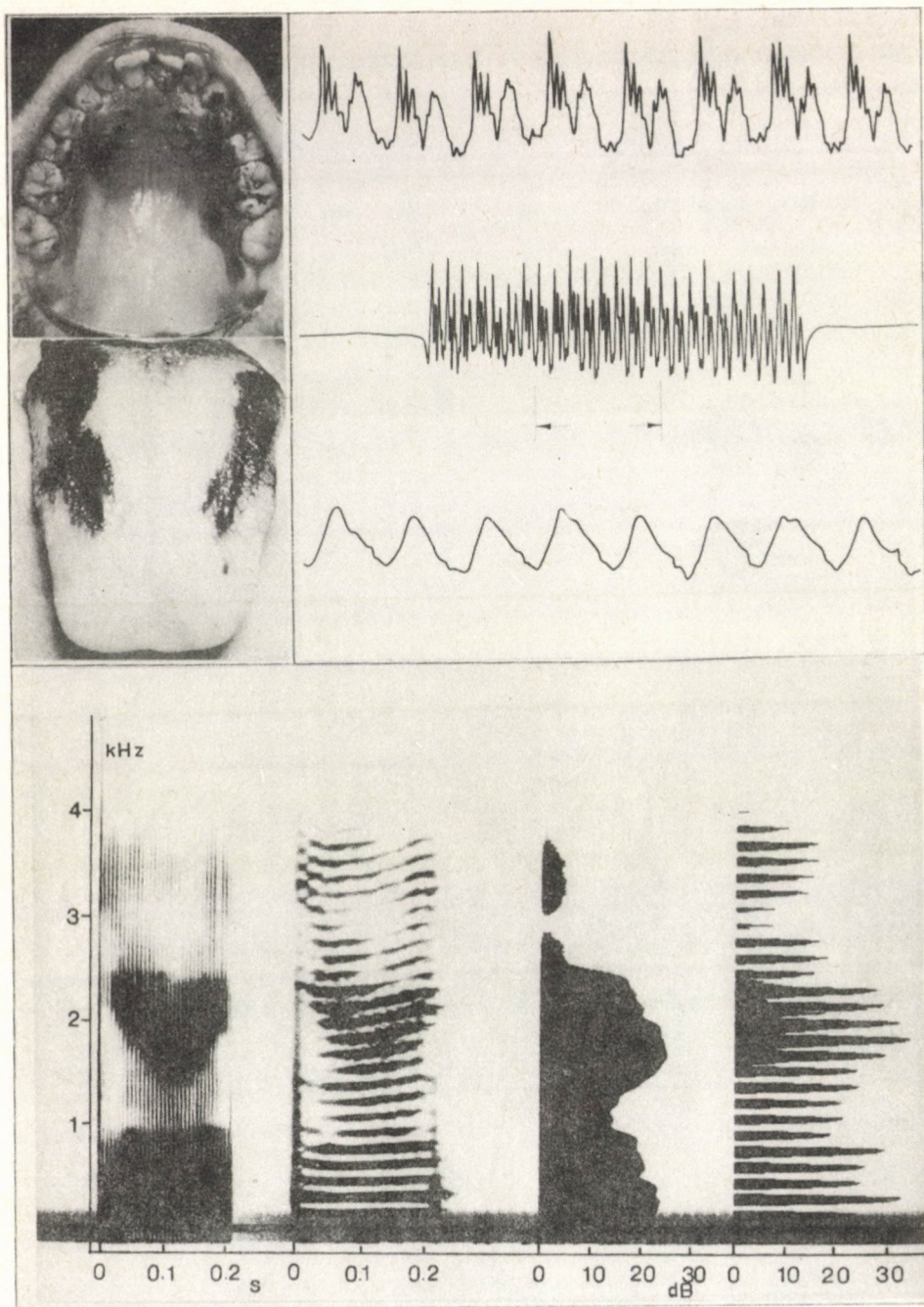
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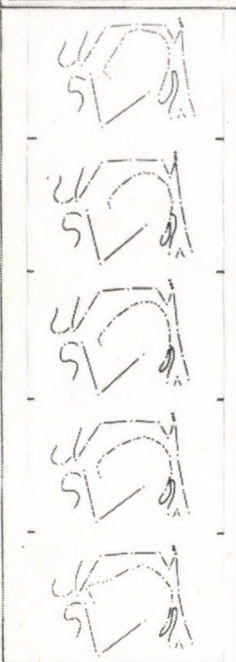
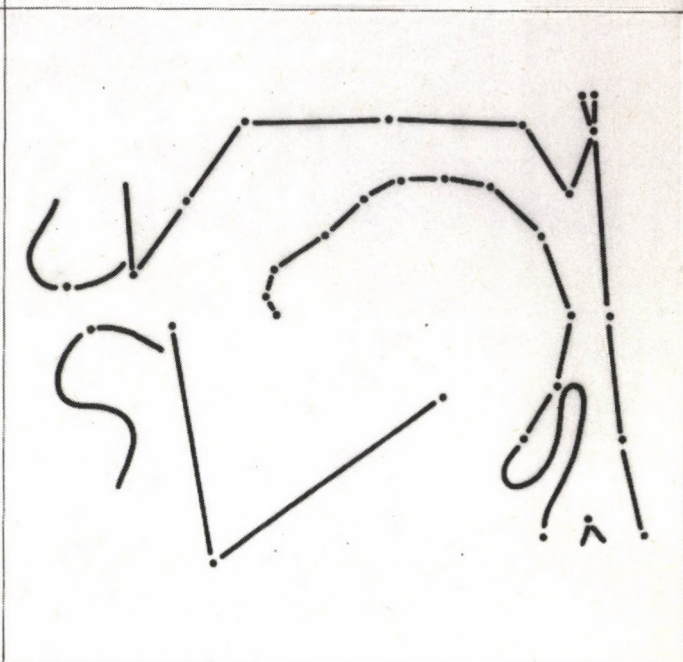
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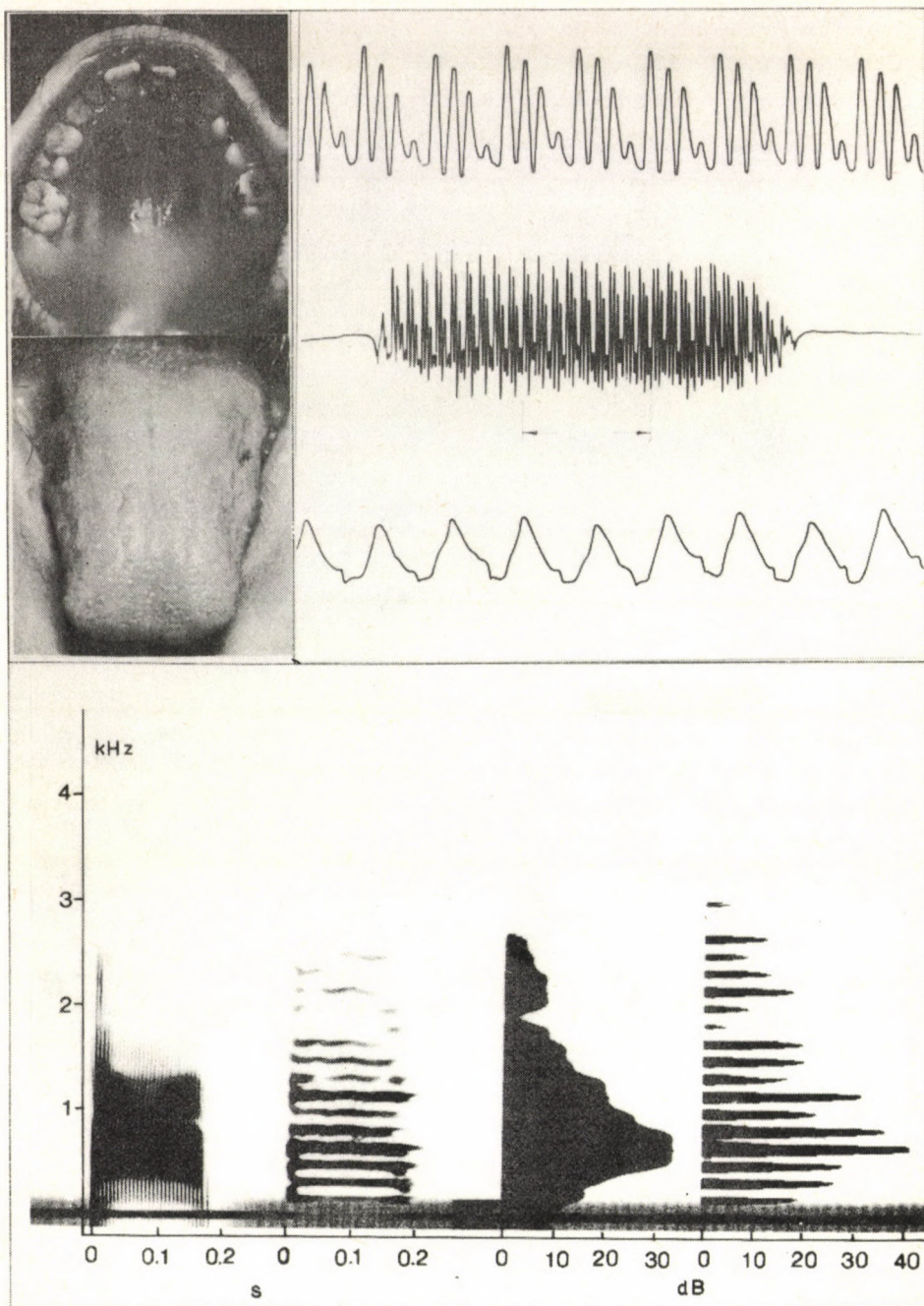
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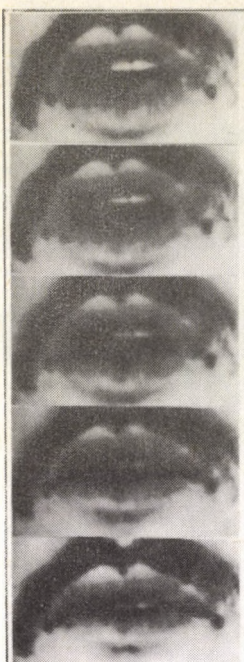
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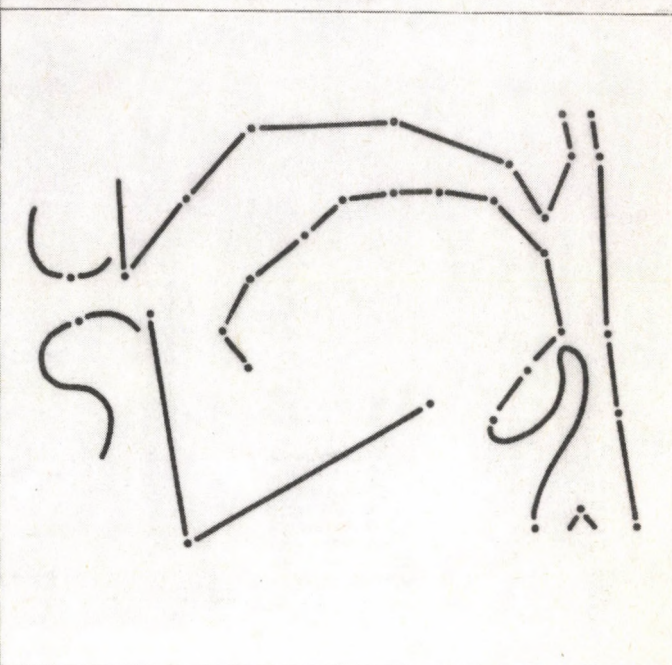
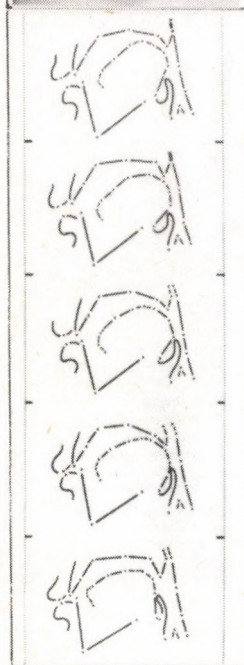
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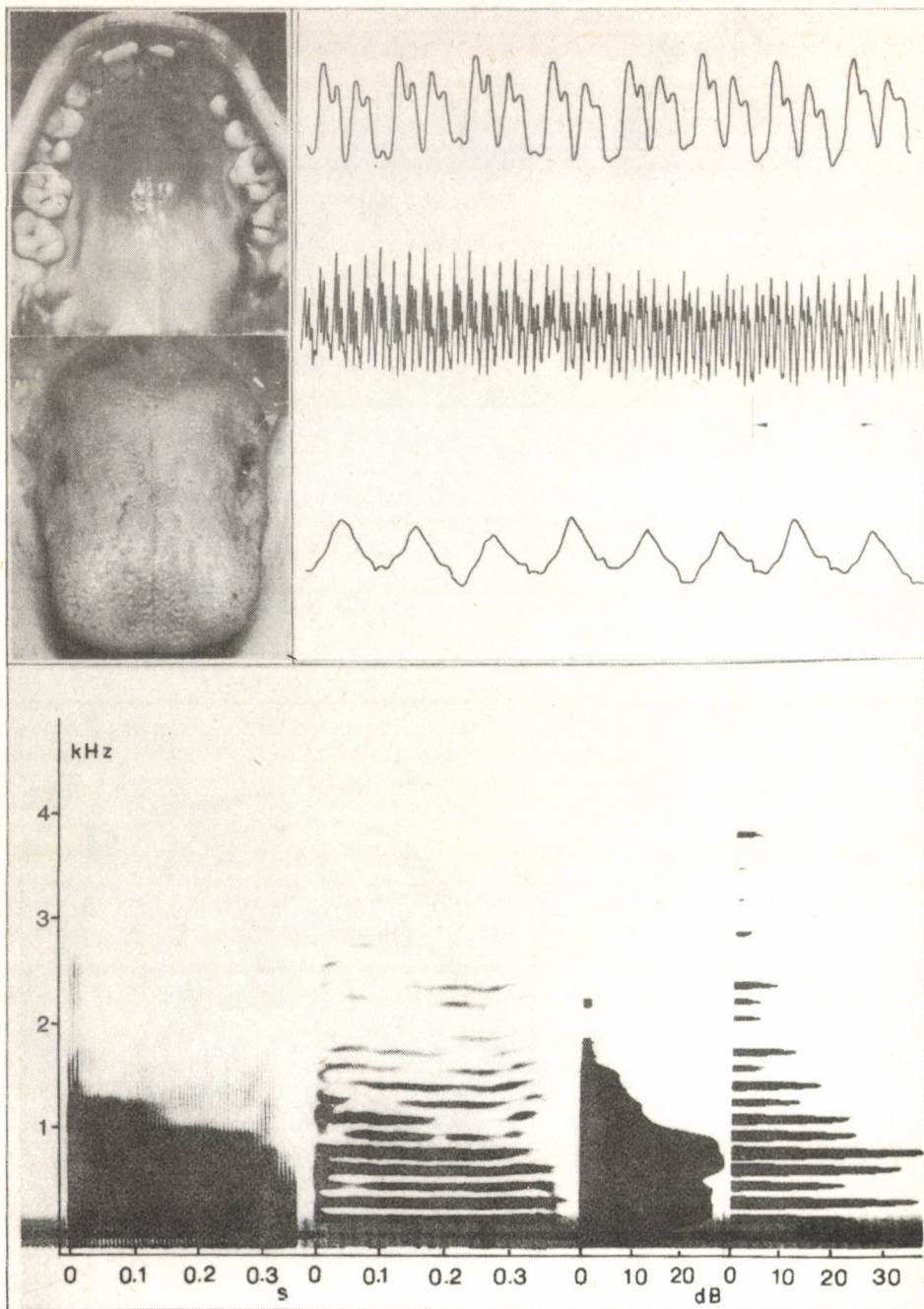
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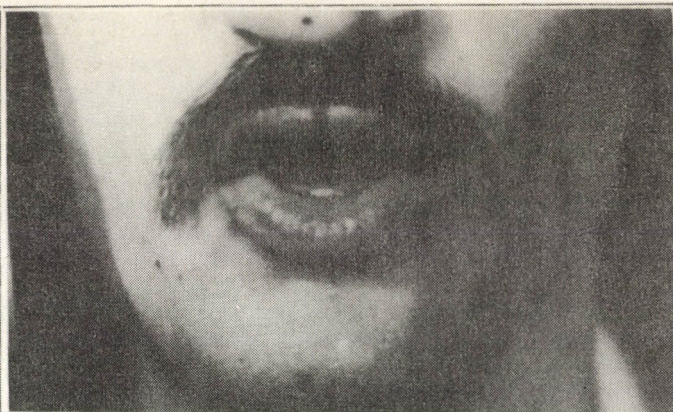
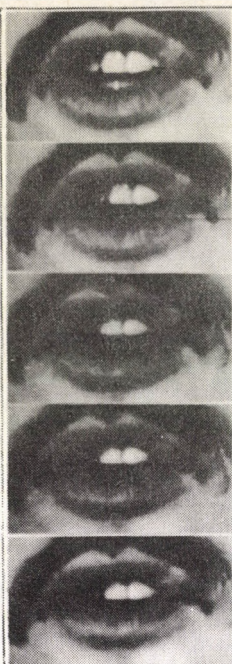
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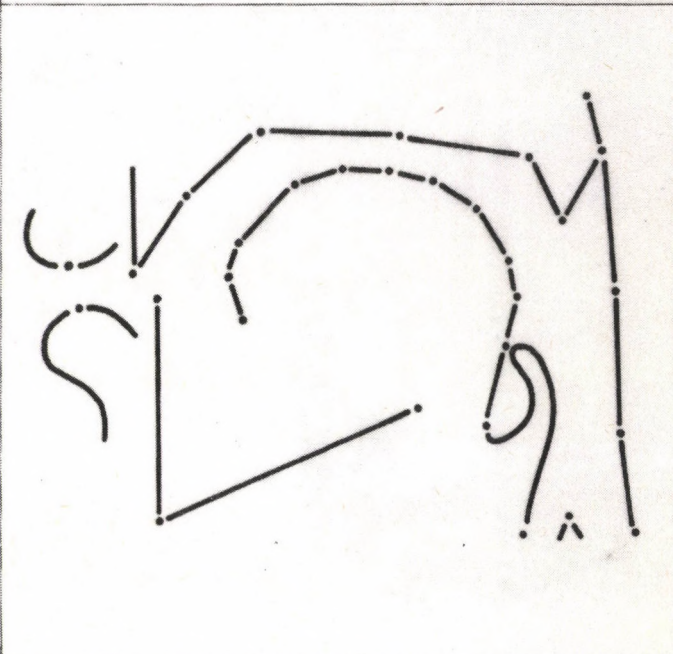
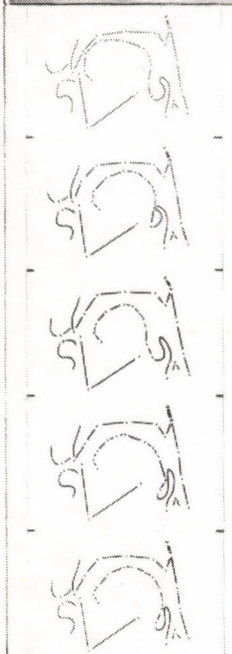


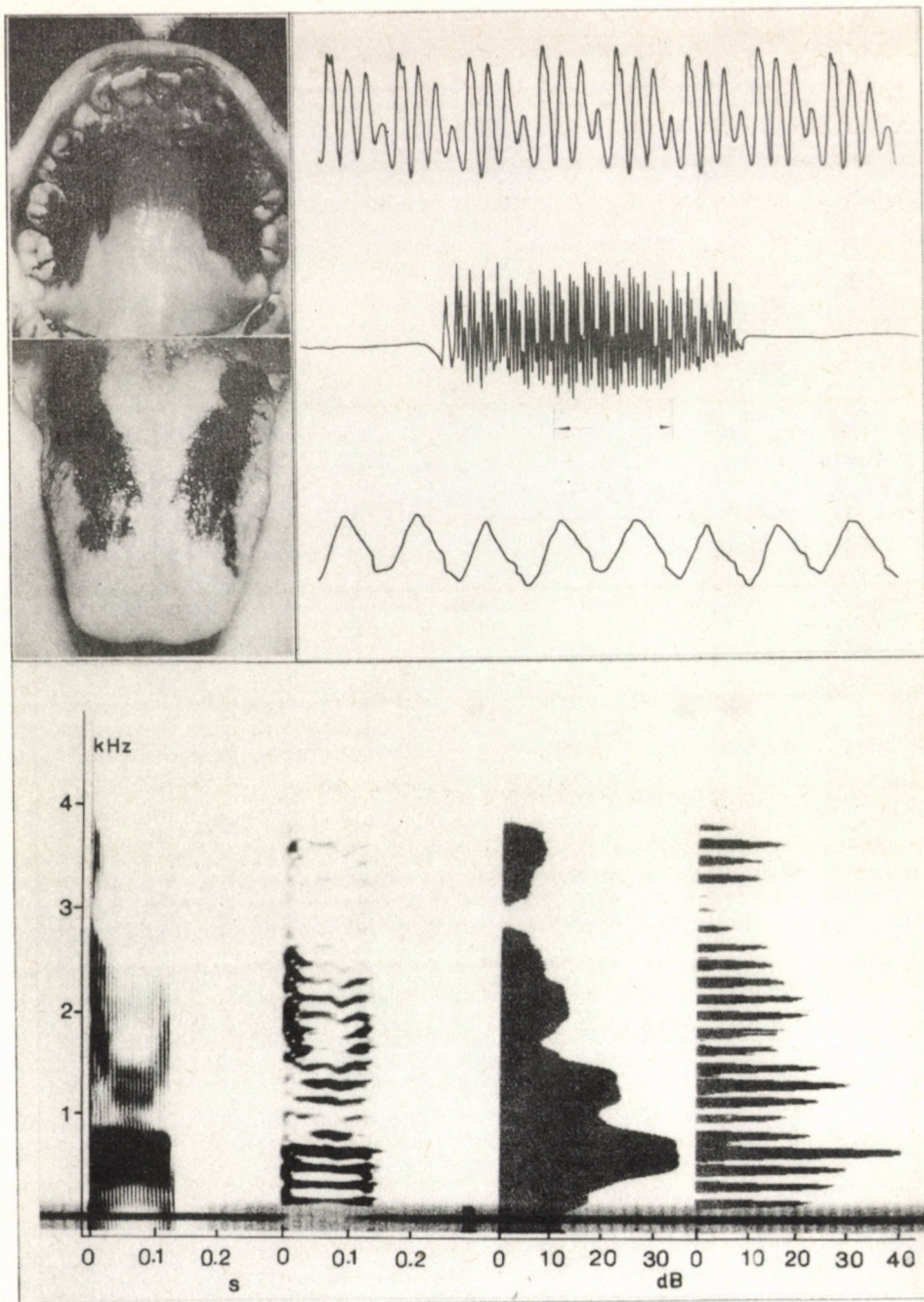
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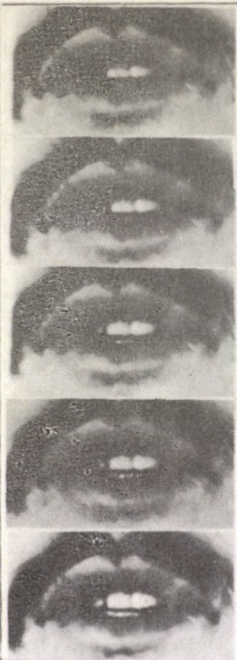

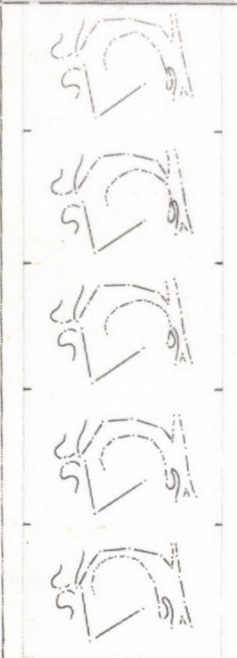
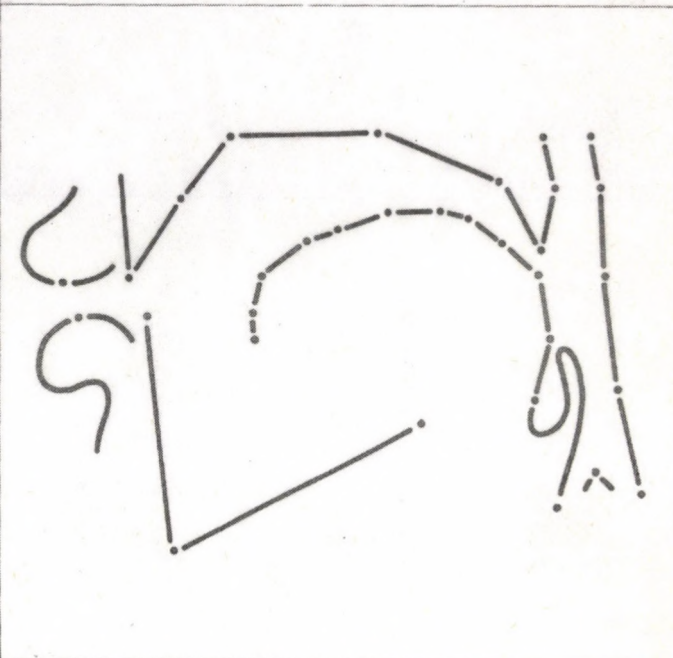
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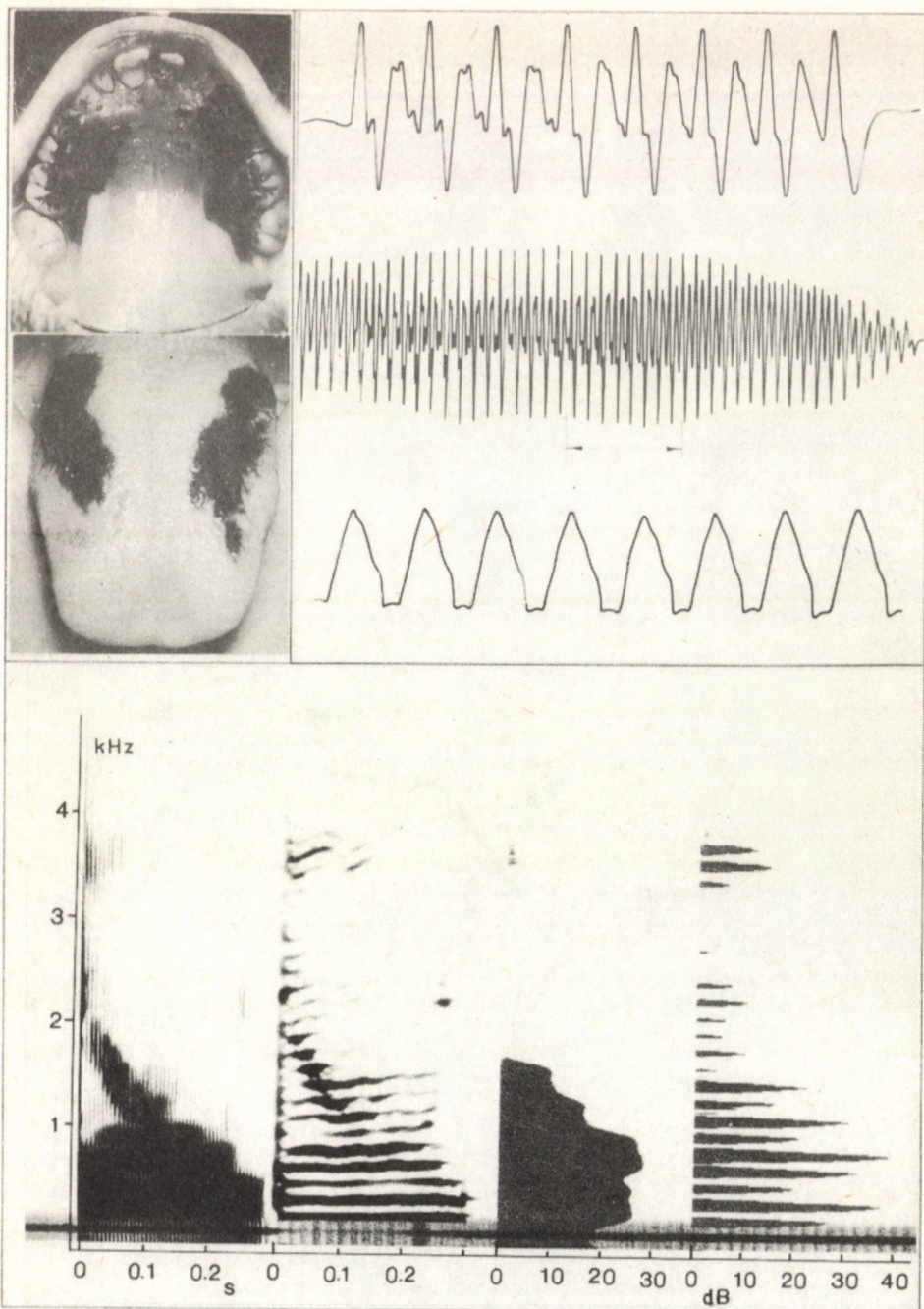
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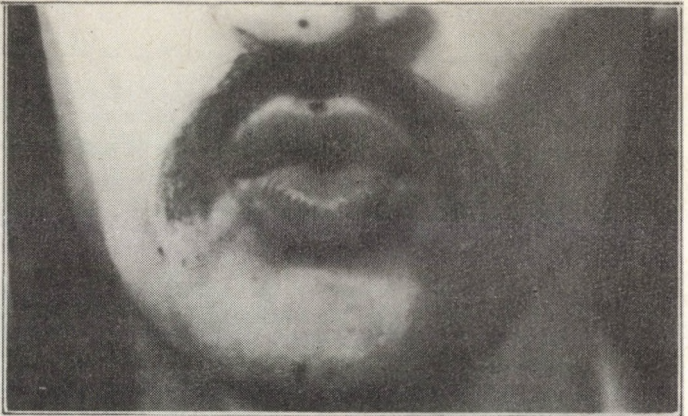
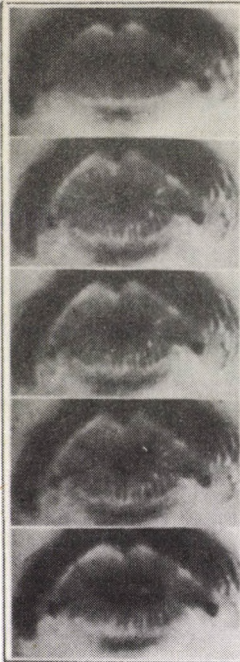
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<p>[õ]</p> <p>[õ]</p>	<p>[m'õtɕ]</p> <p><i>miąc</i></p> <p>[m'õć]</p> <p style="font-size: 2em; float: right;">8</p>
	



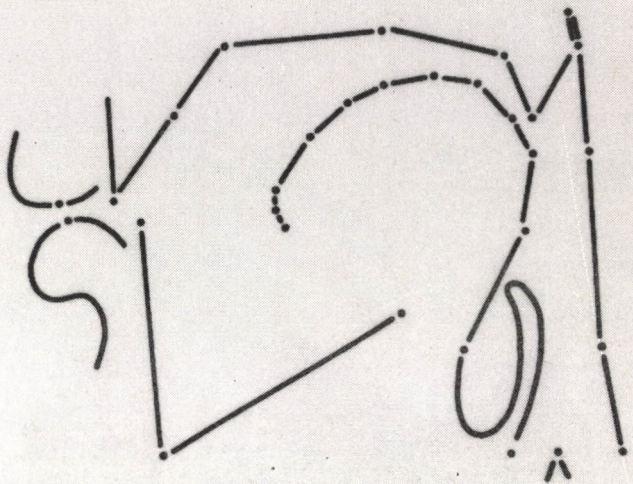


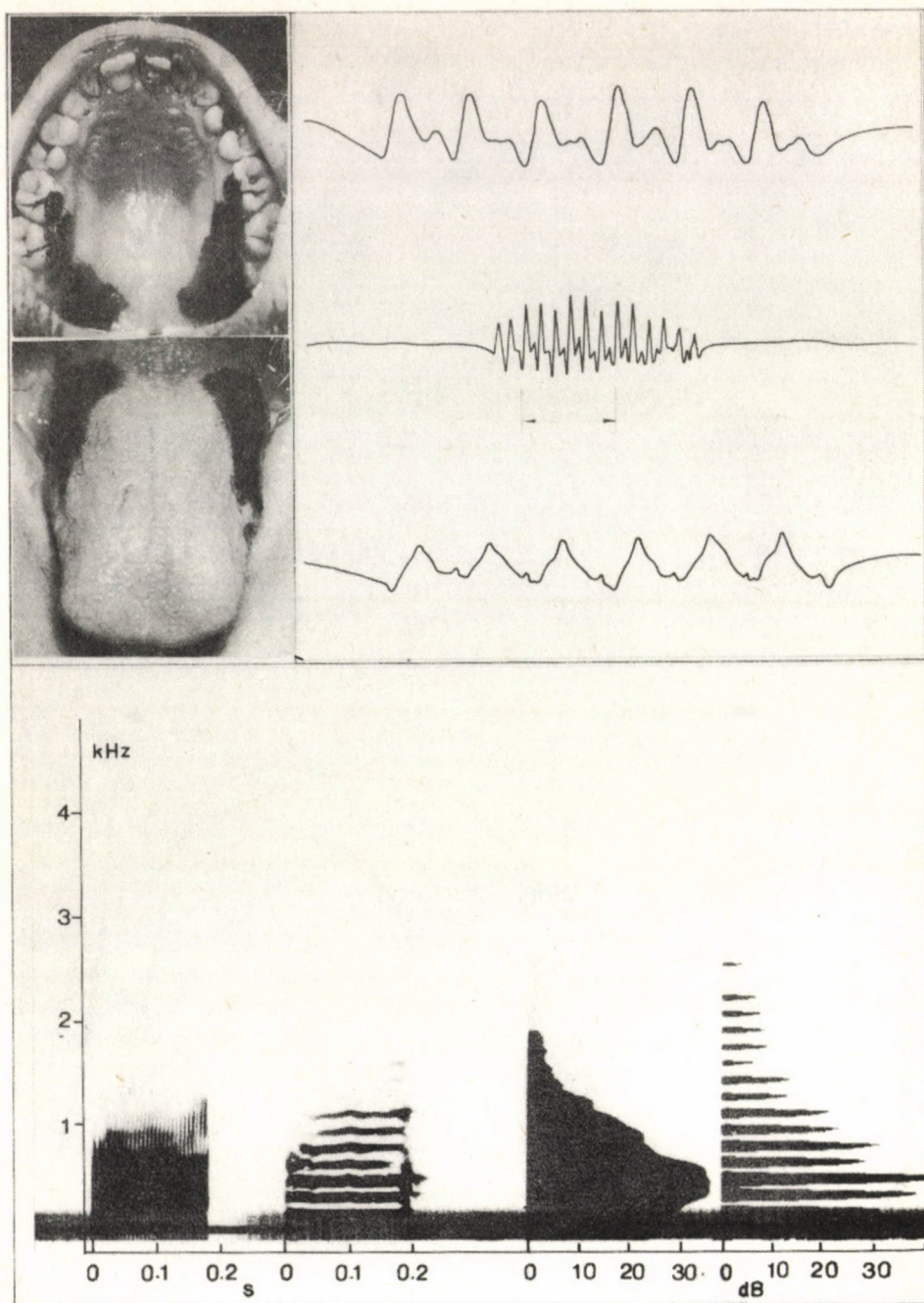
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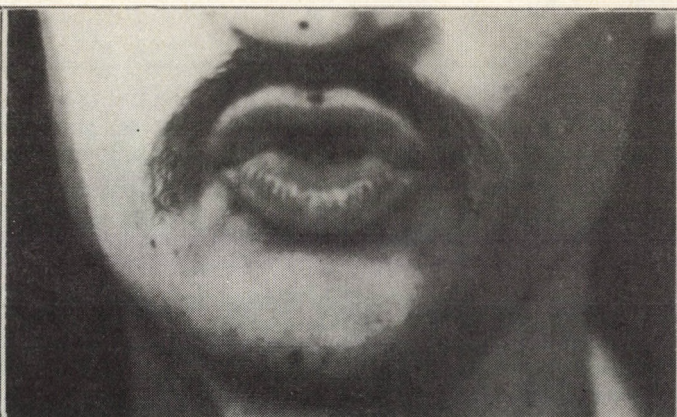
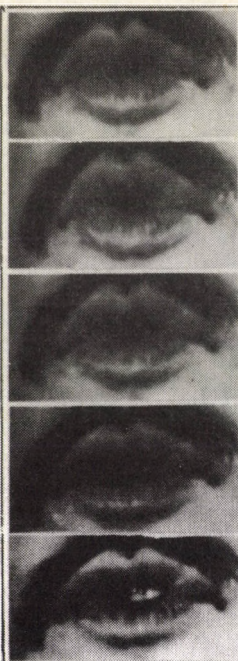
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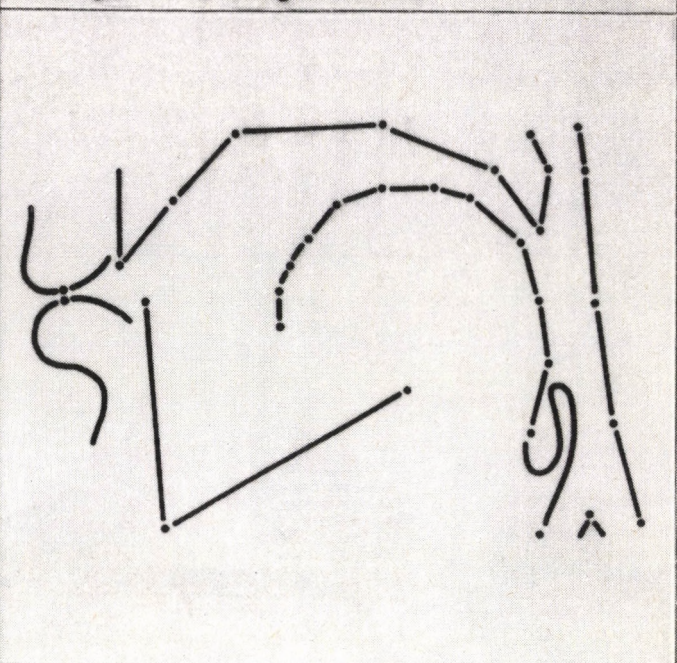
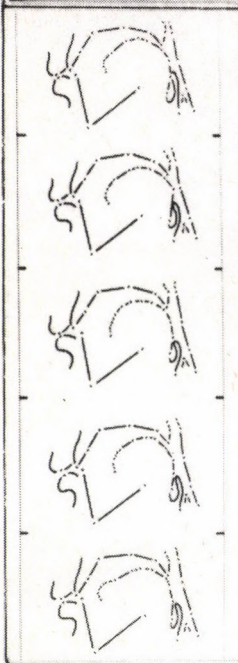


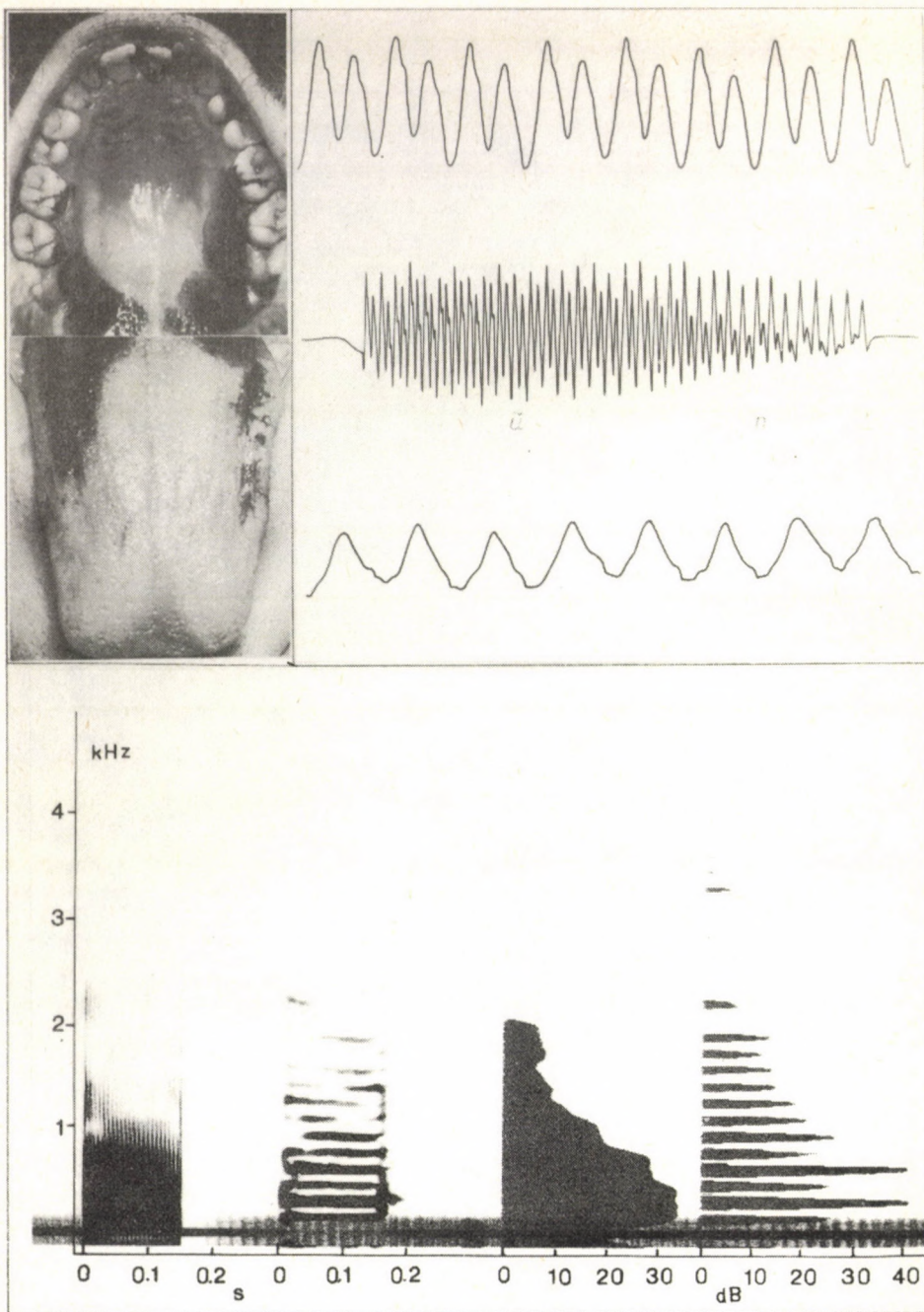
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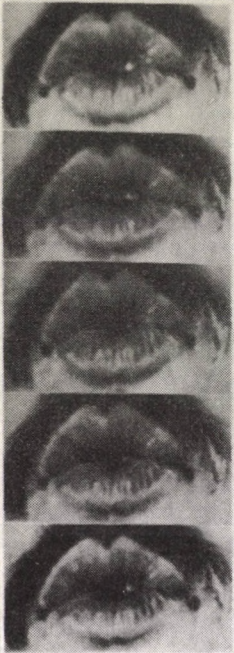
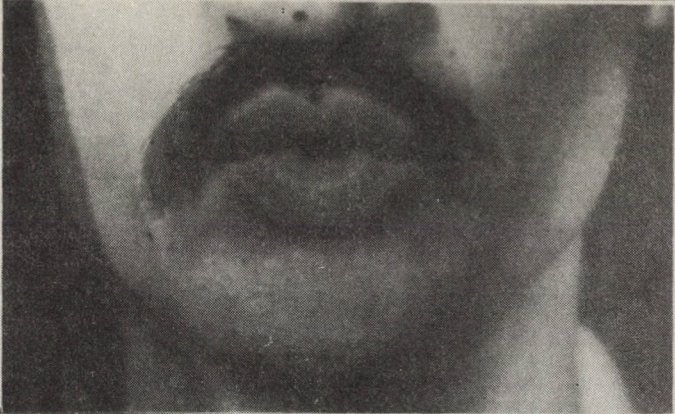
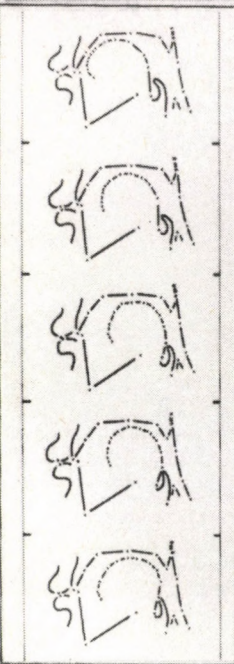
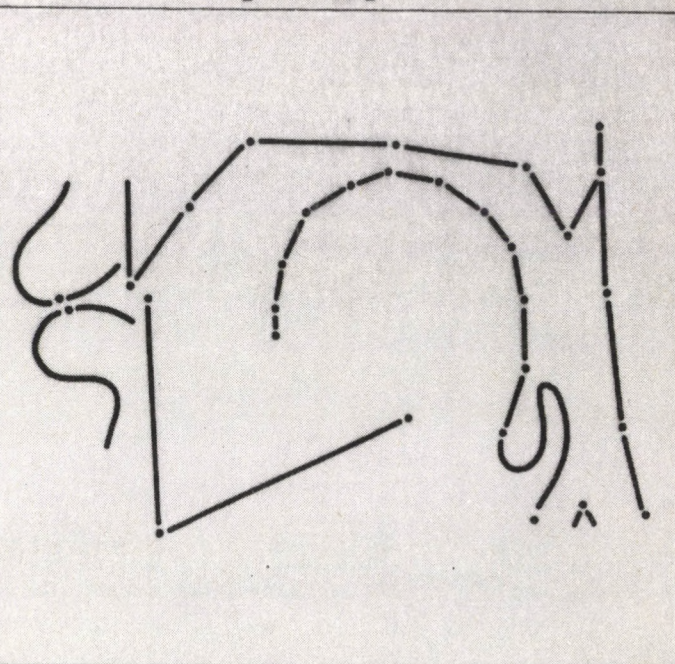
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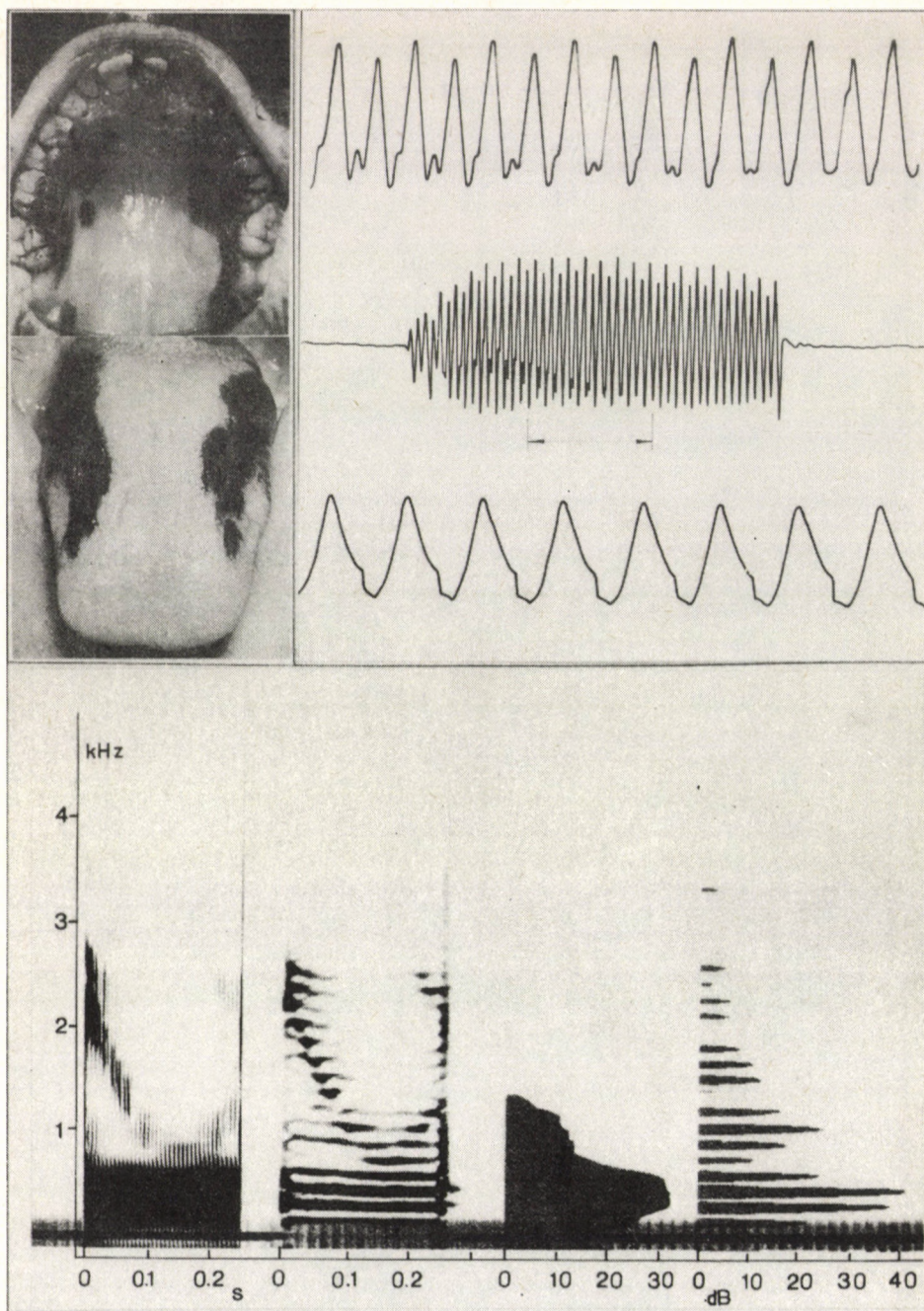
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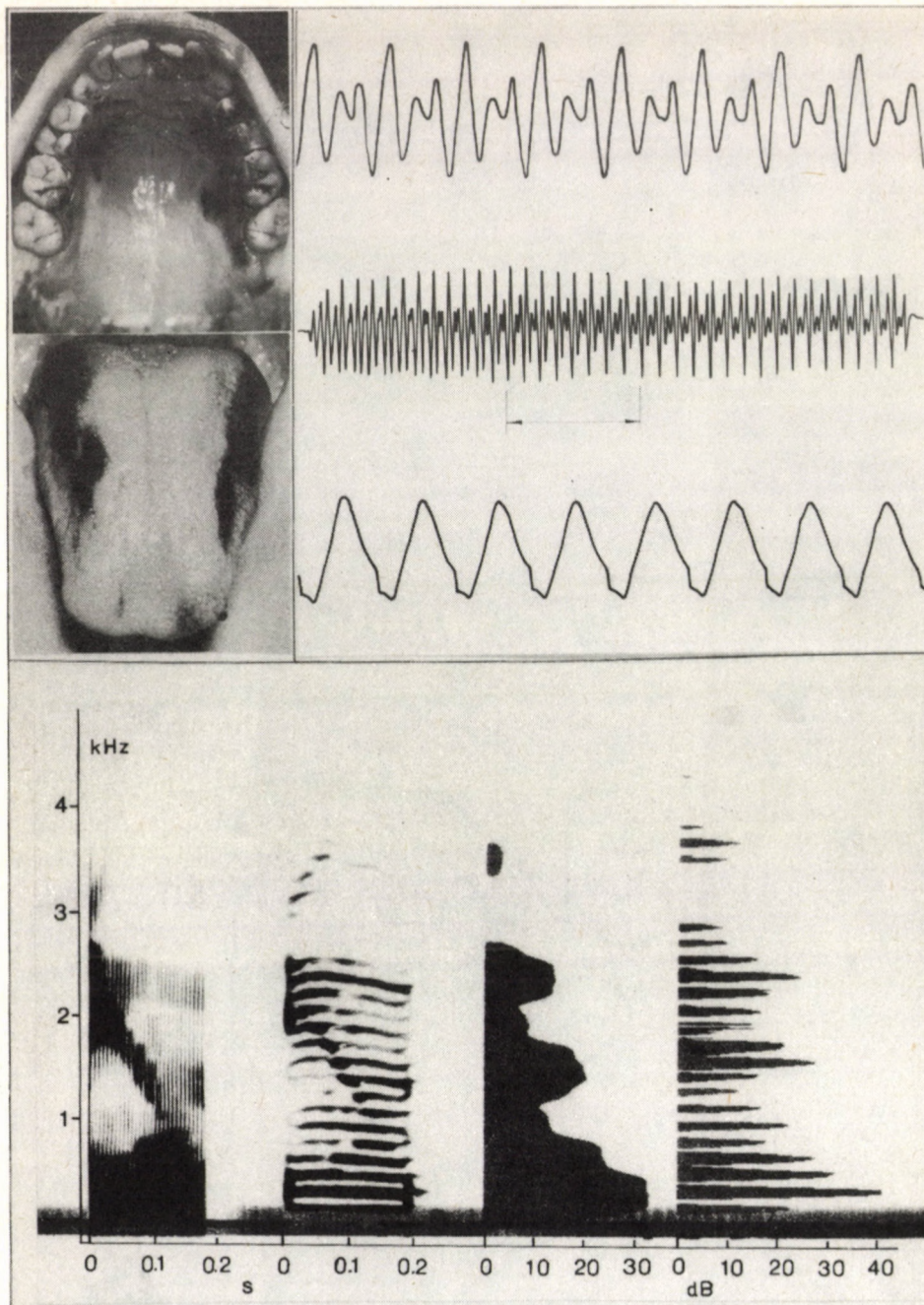


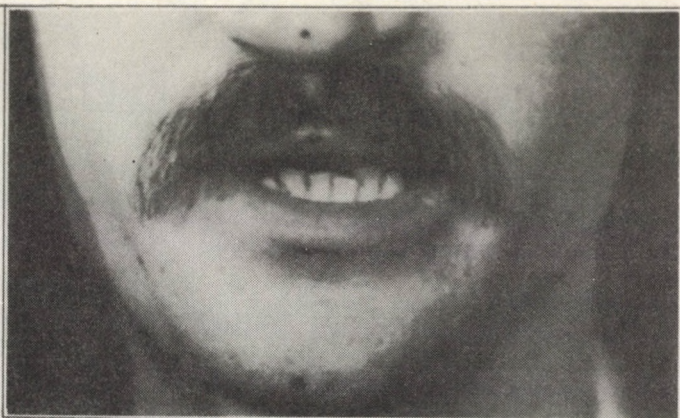
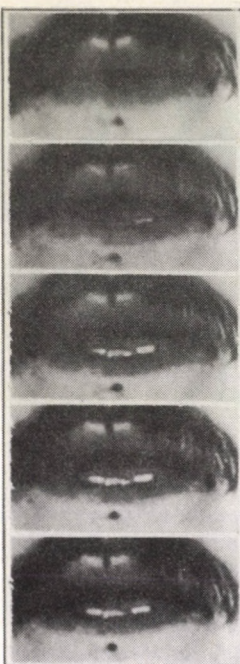


						
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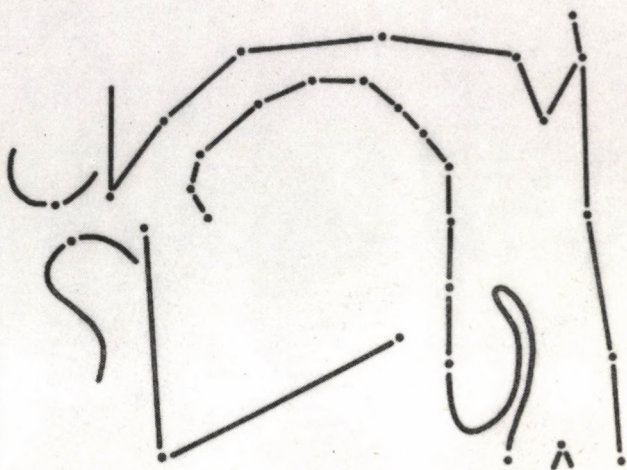
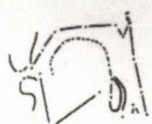
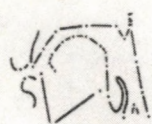
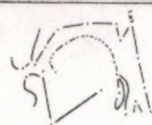
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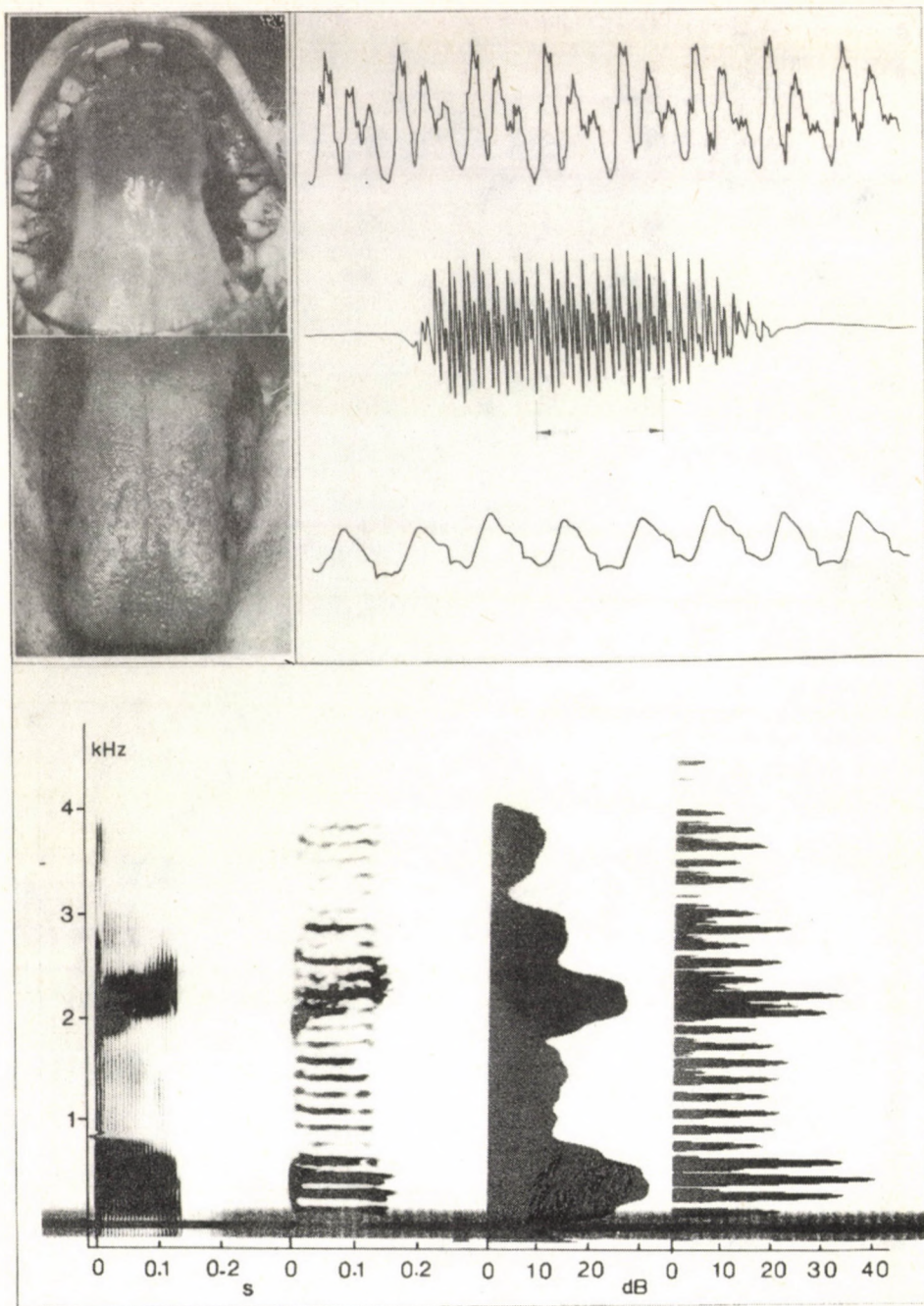
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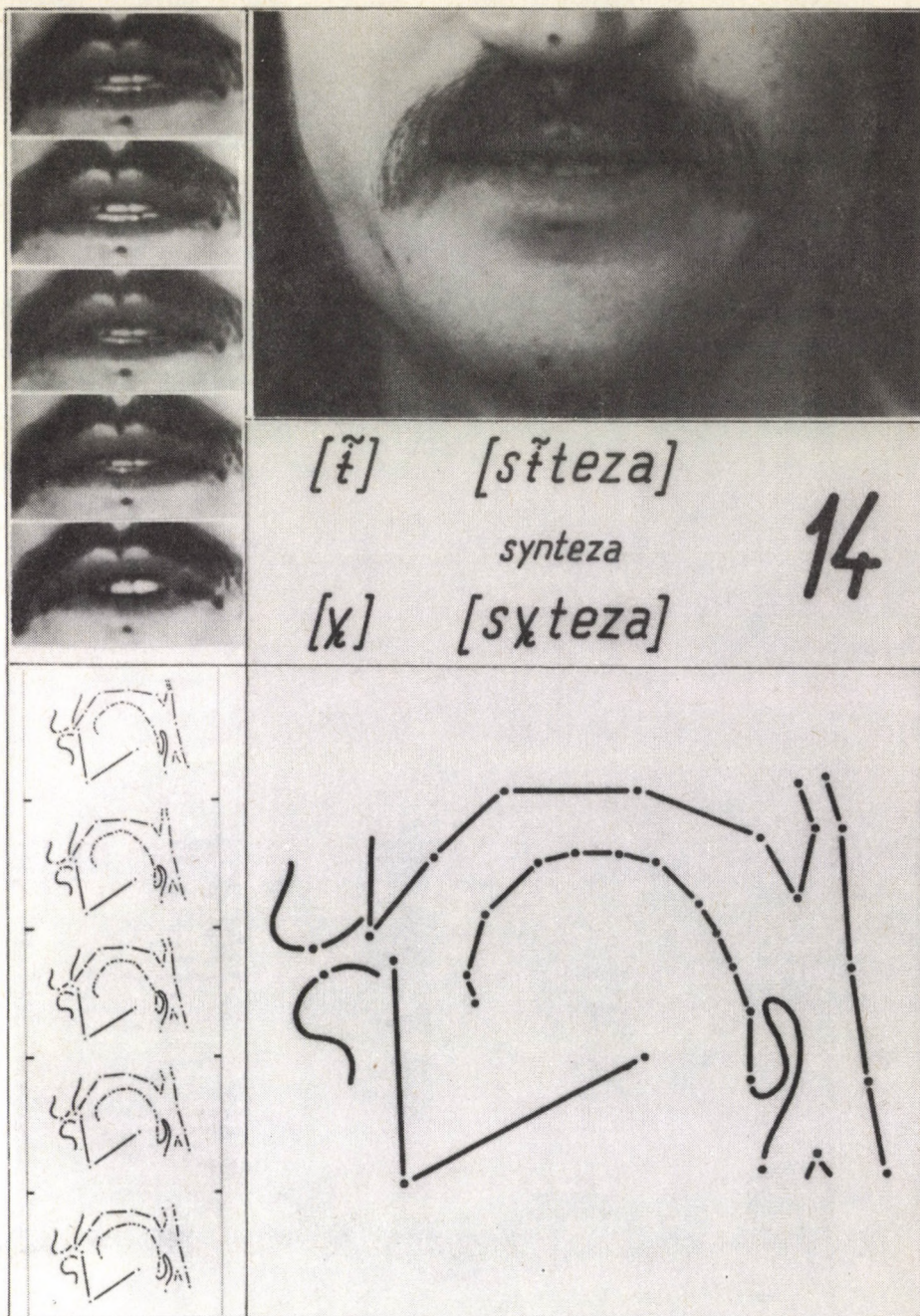
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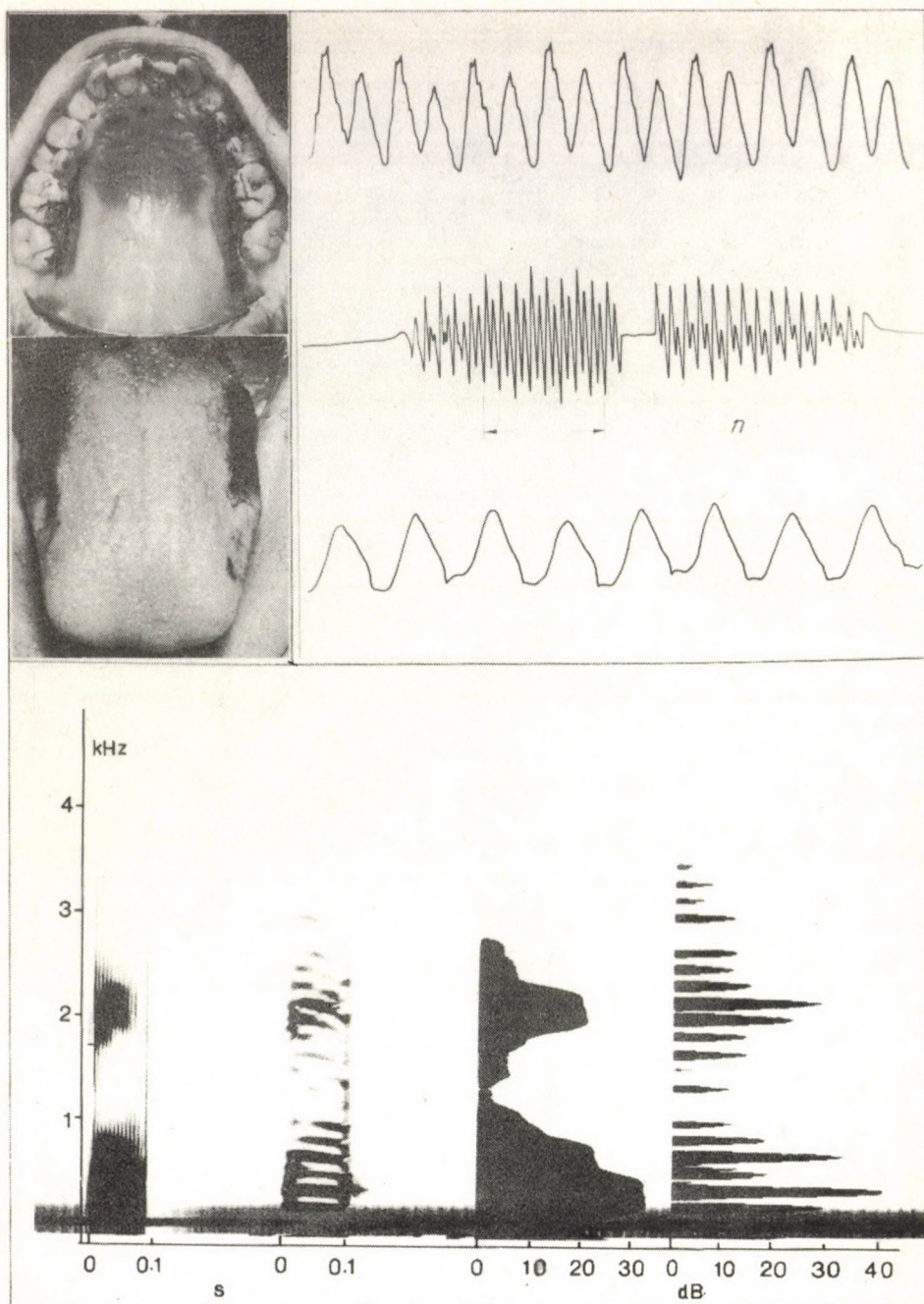
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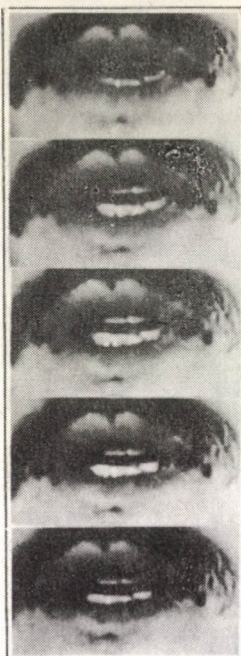
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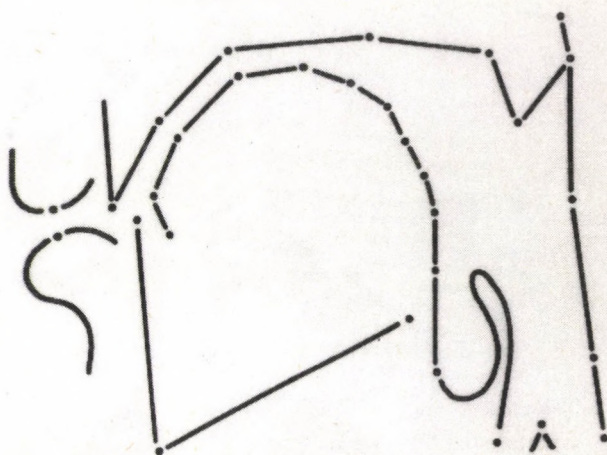
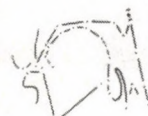
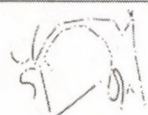


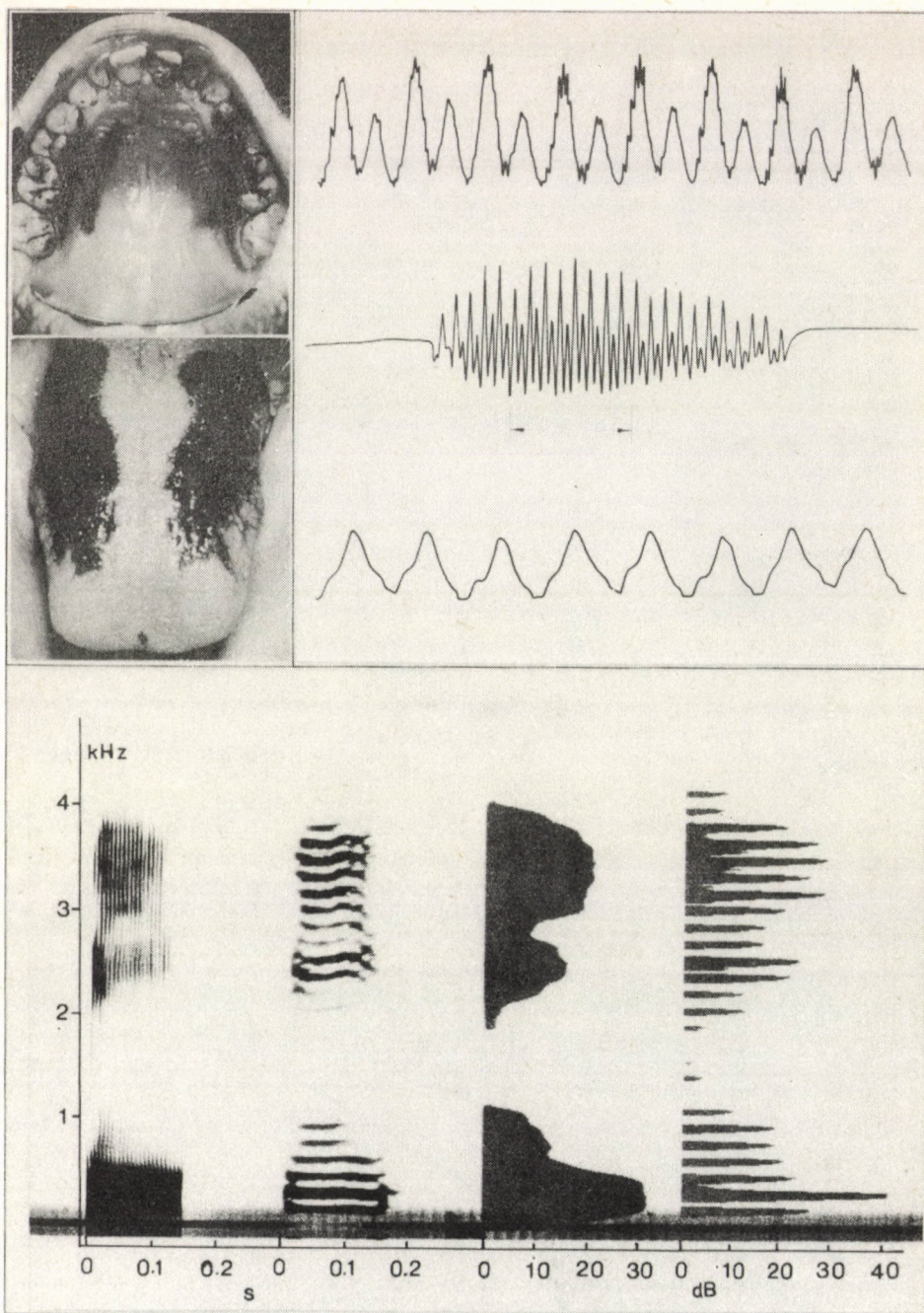
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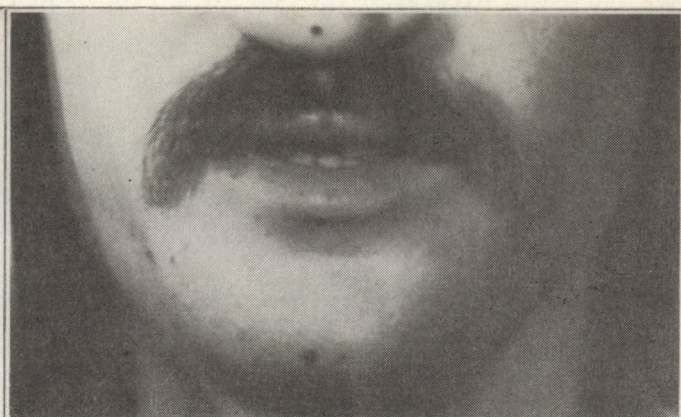
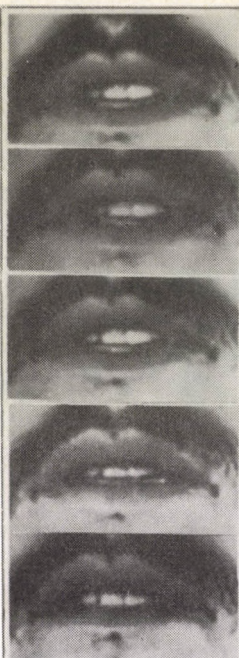
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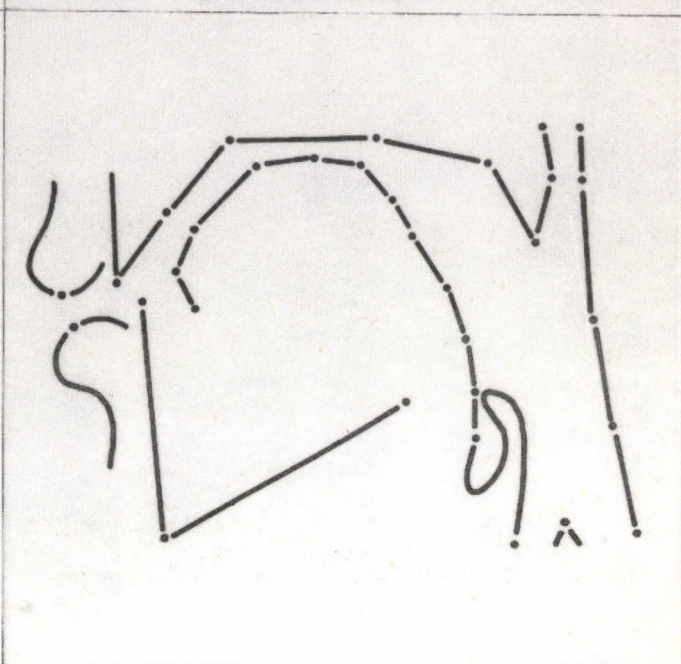
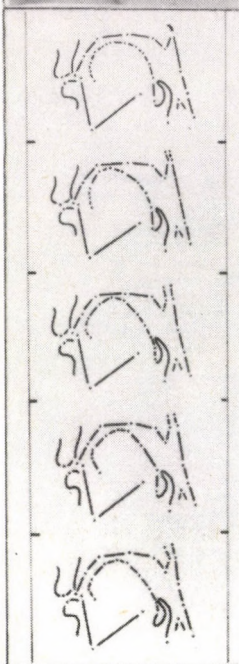


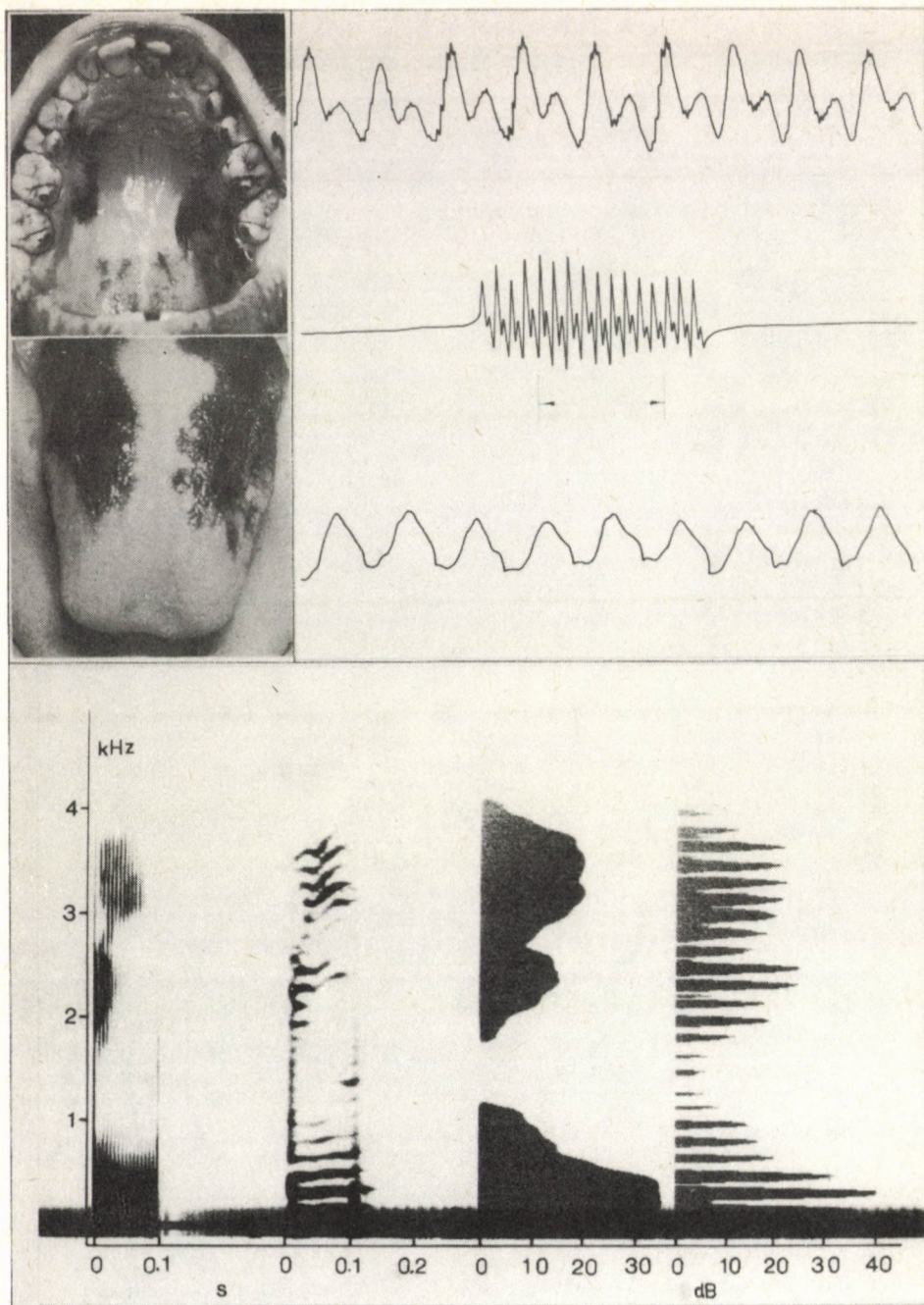
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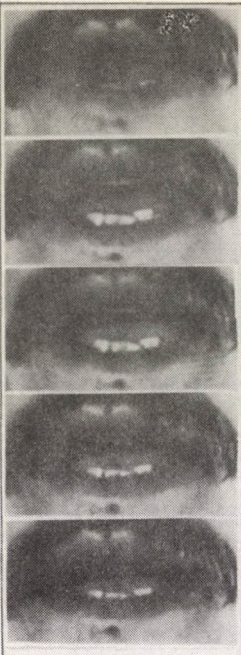
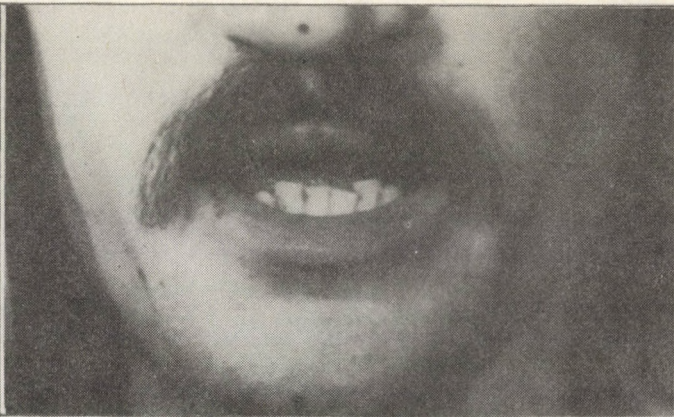
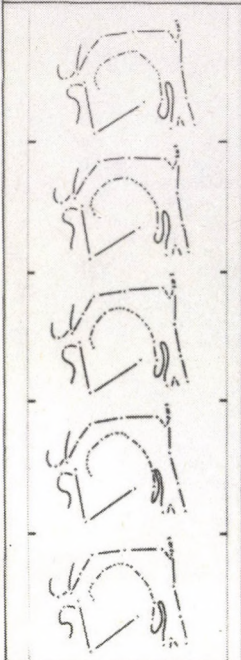
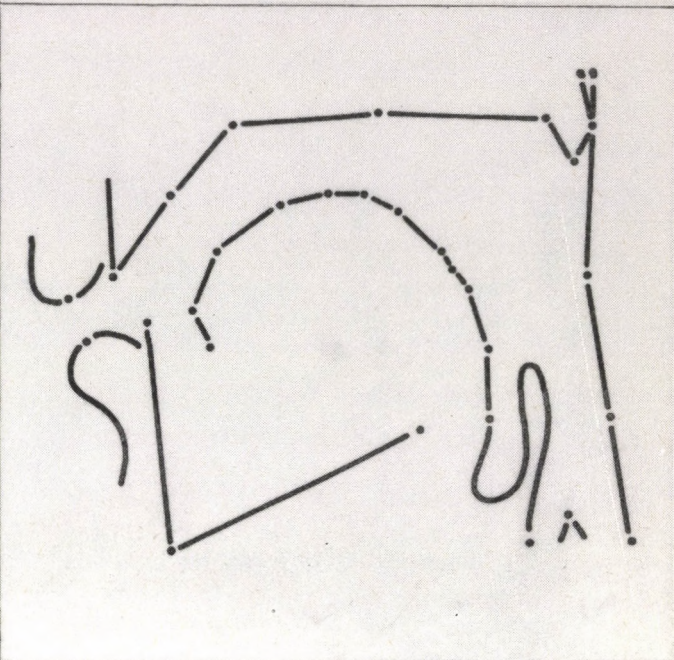
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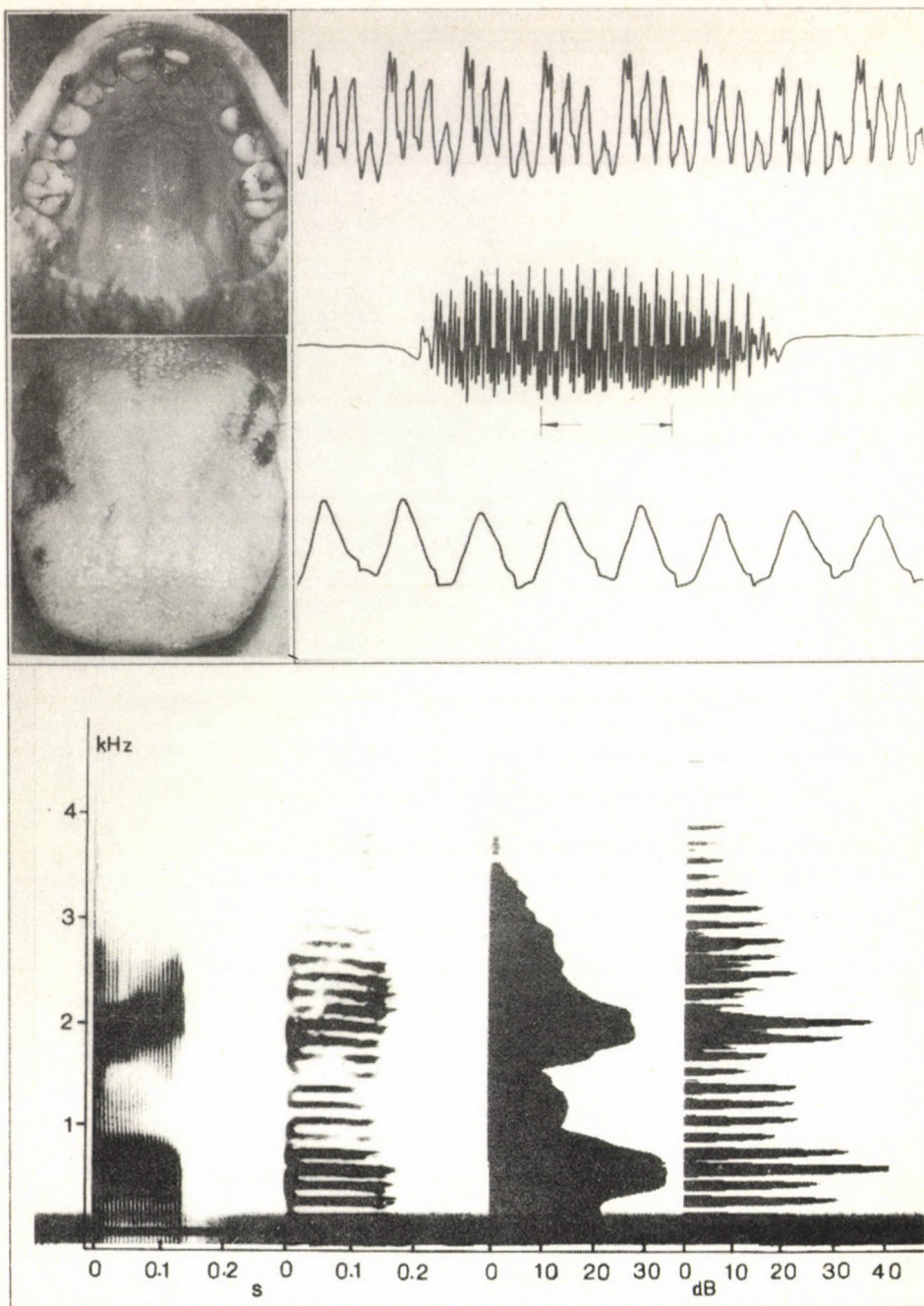
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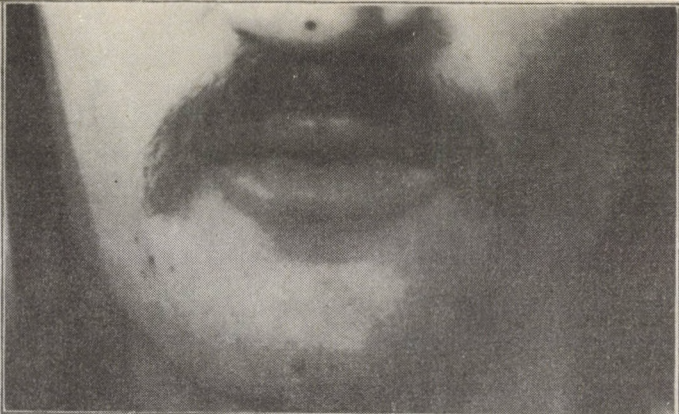
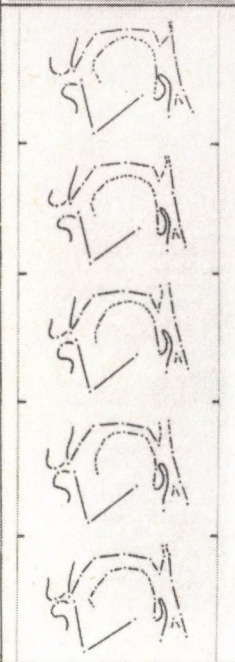
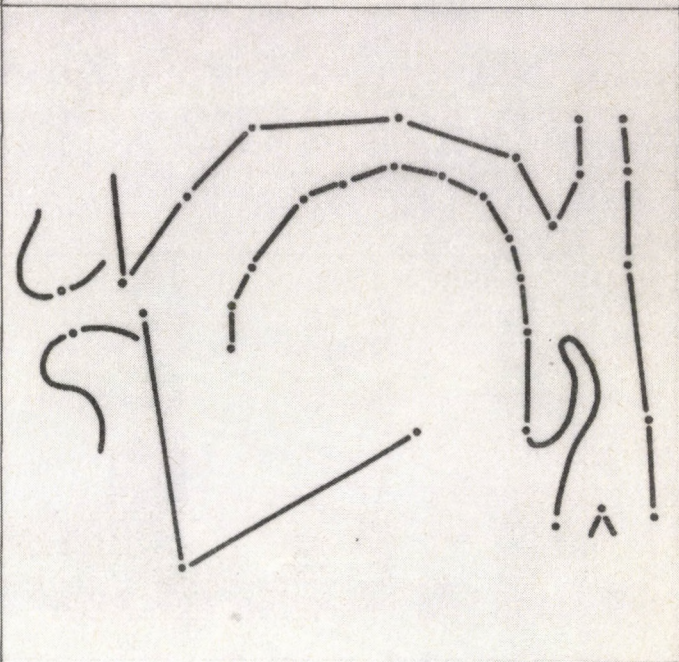
16

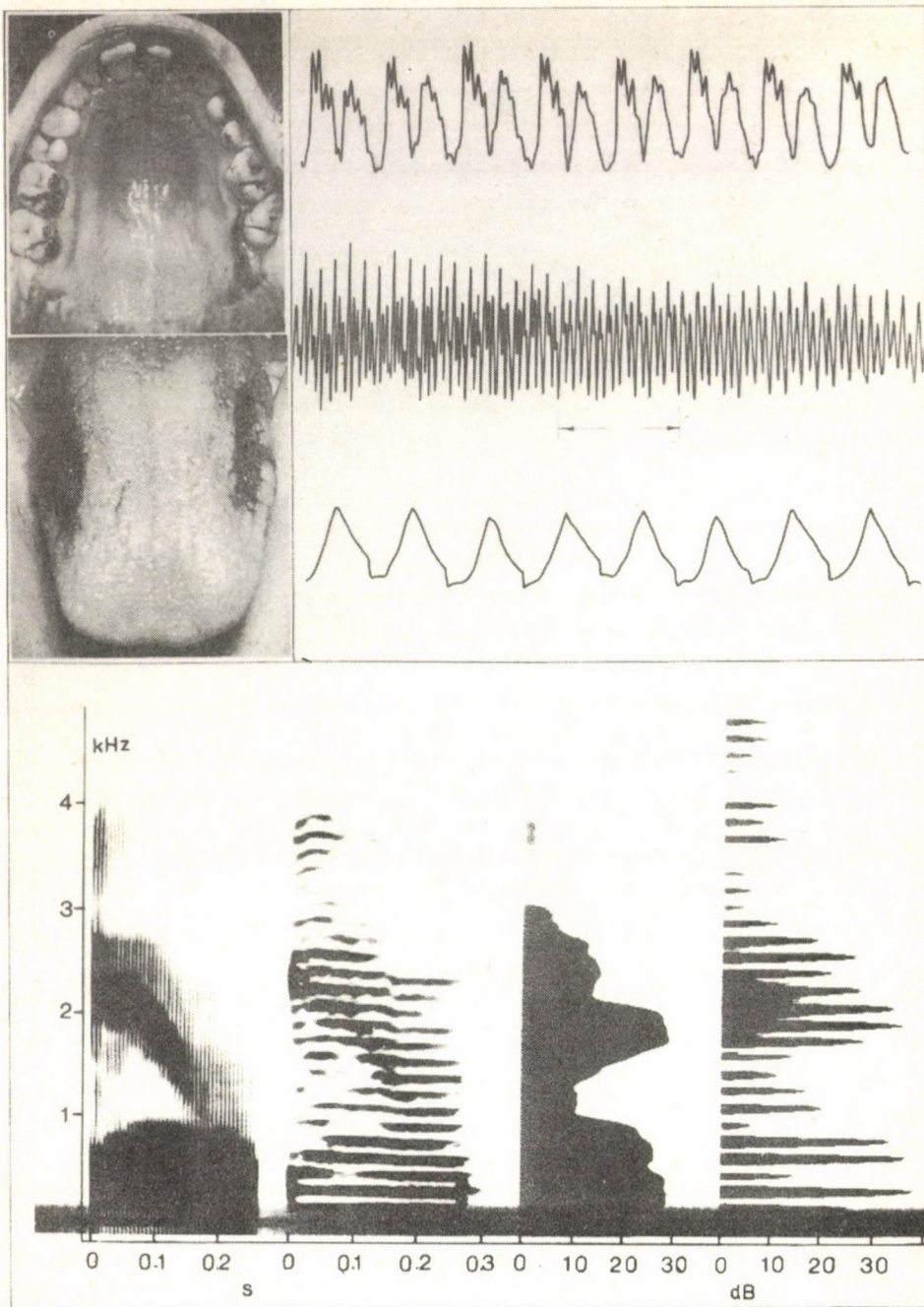


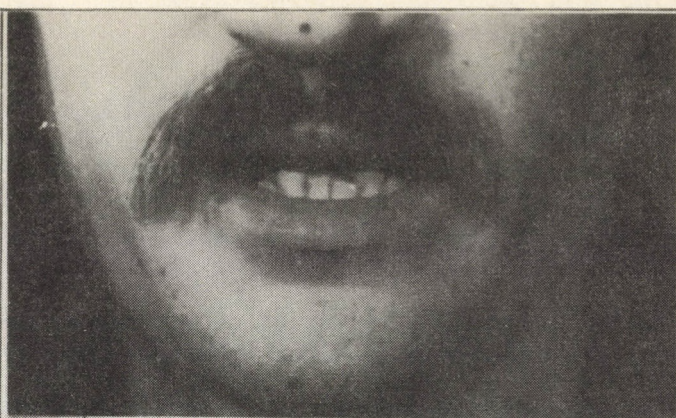
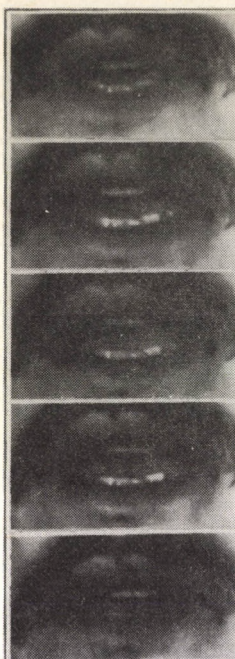


	
	<p>[e] [b ek]</p> <p style="text-align: center;">bek</p> <p>[e] [b ek]</p> <p style="text-align: right; font-size: 2em;">17</p>
	



	
	<p>[ẽ] [gẽba]</p> <p style="text-align: center;">gẽba</p> <p>[e] [gɛba]</p> <p style="text-align: right; font-size: 2em; font-weight: bold;">18</p>
	



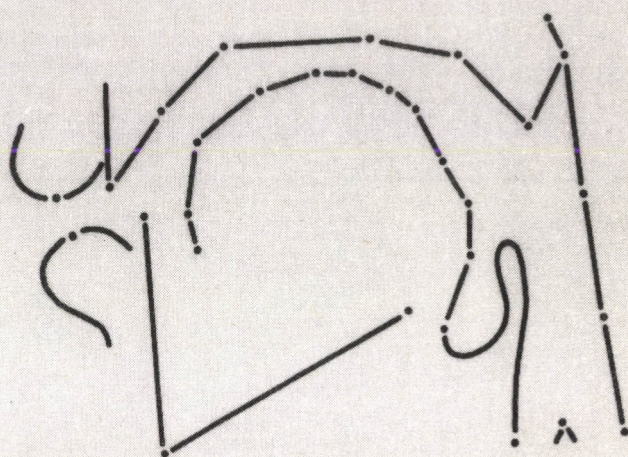
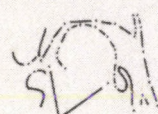


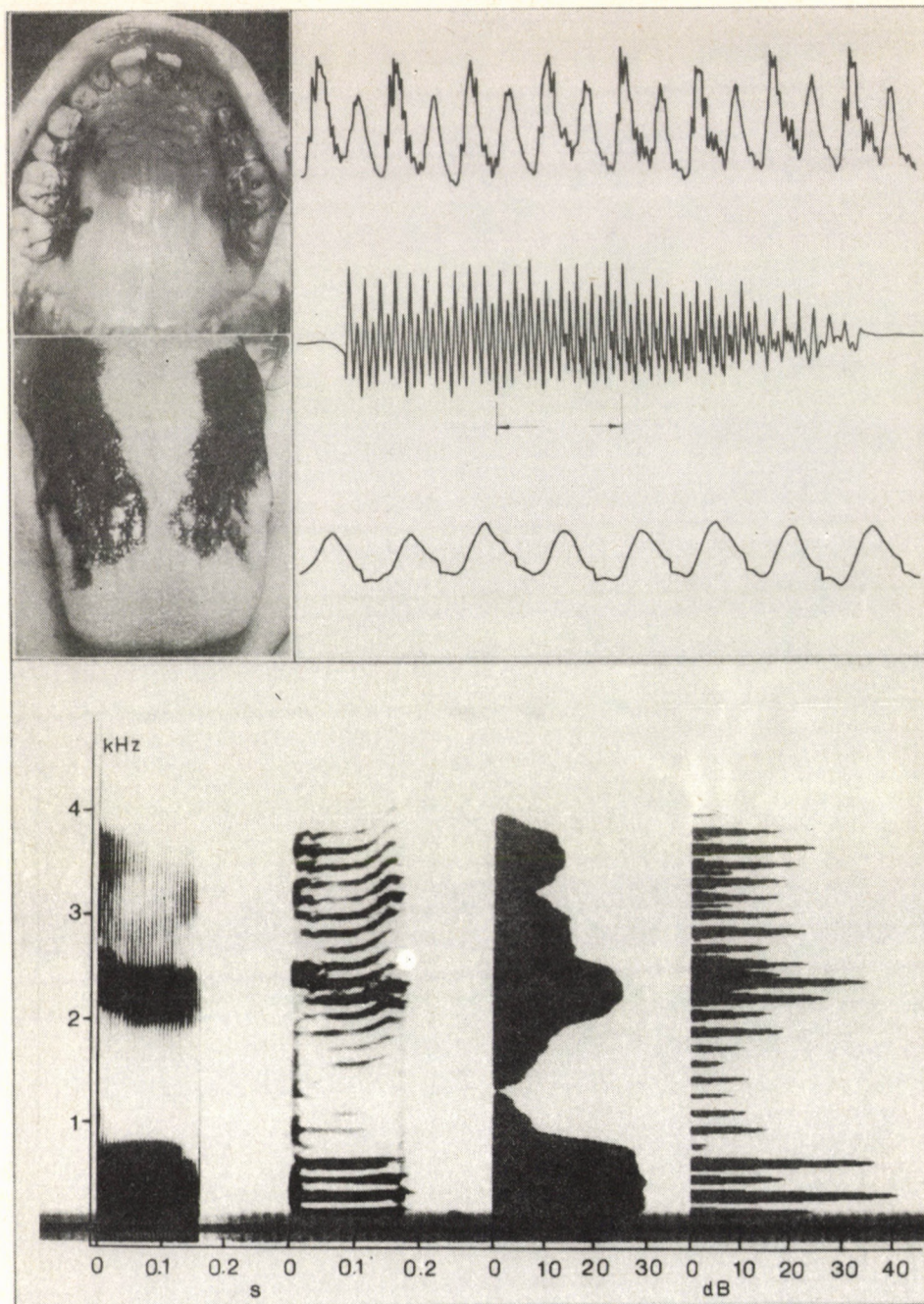
[e] [m'etɕ]

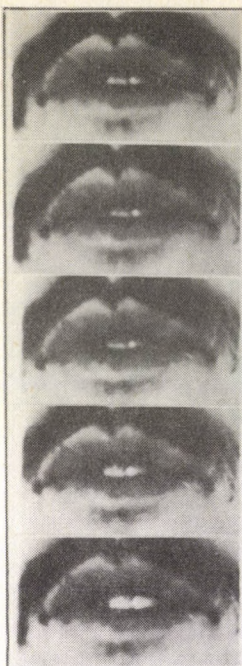
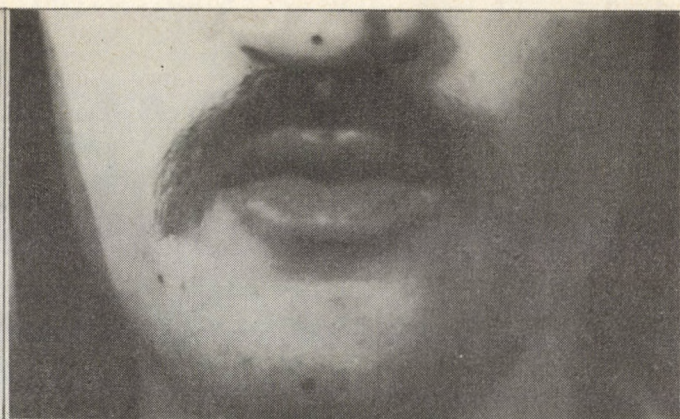
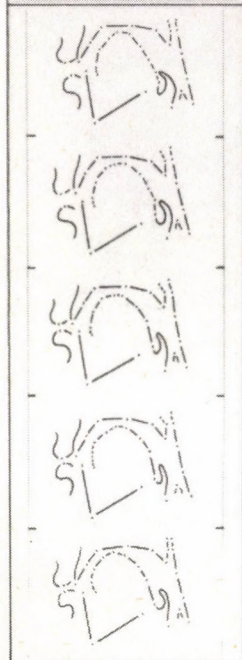
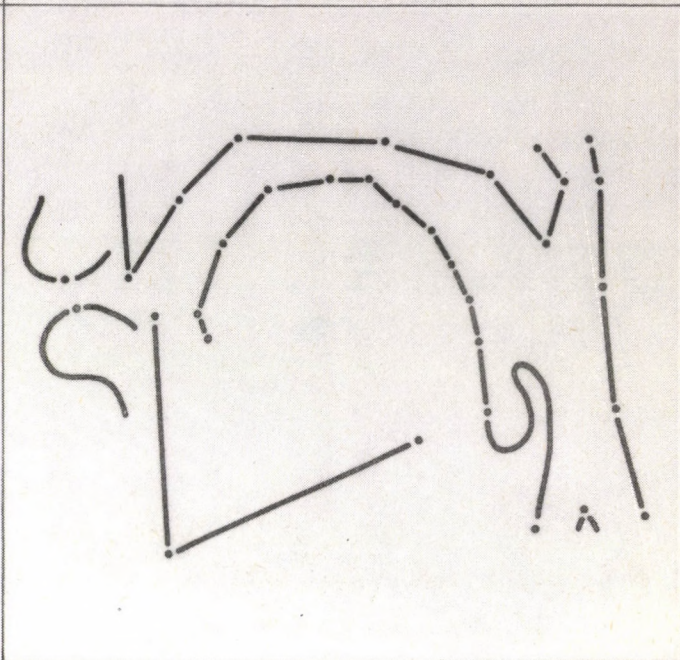
mieć

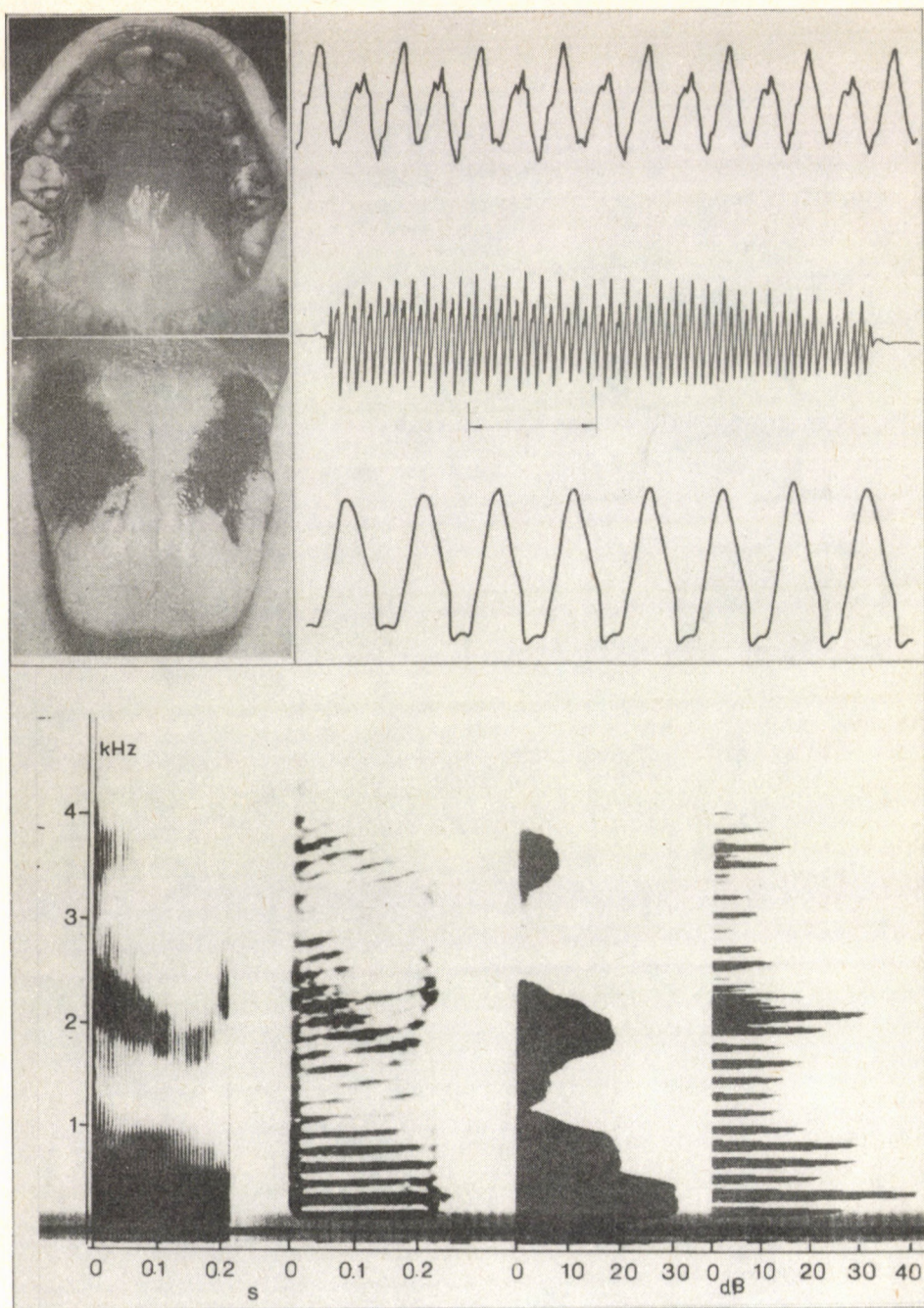
[e] [m'ɛć]

19

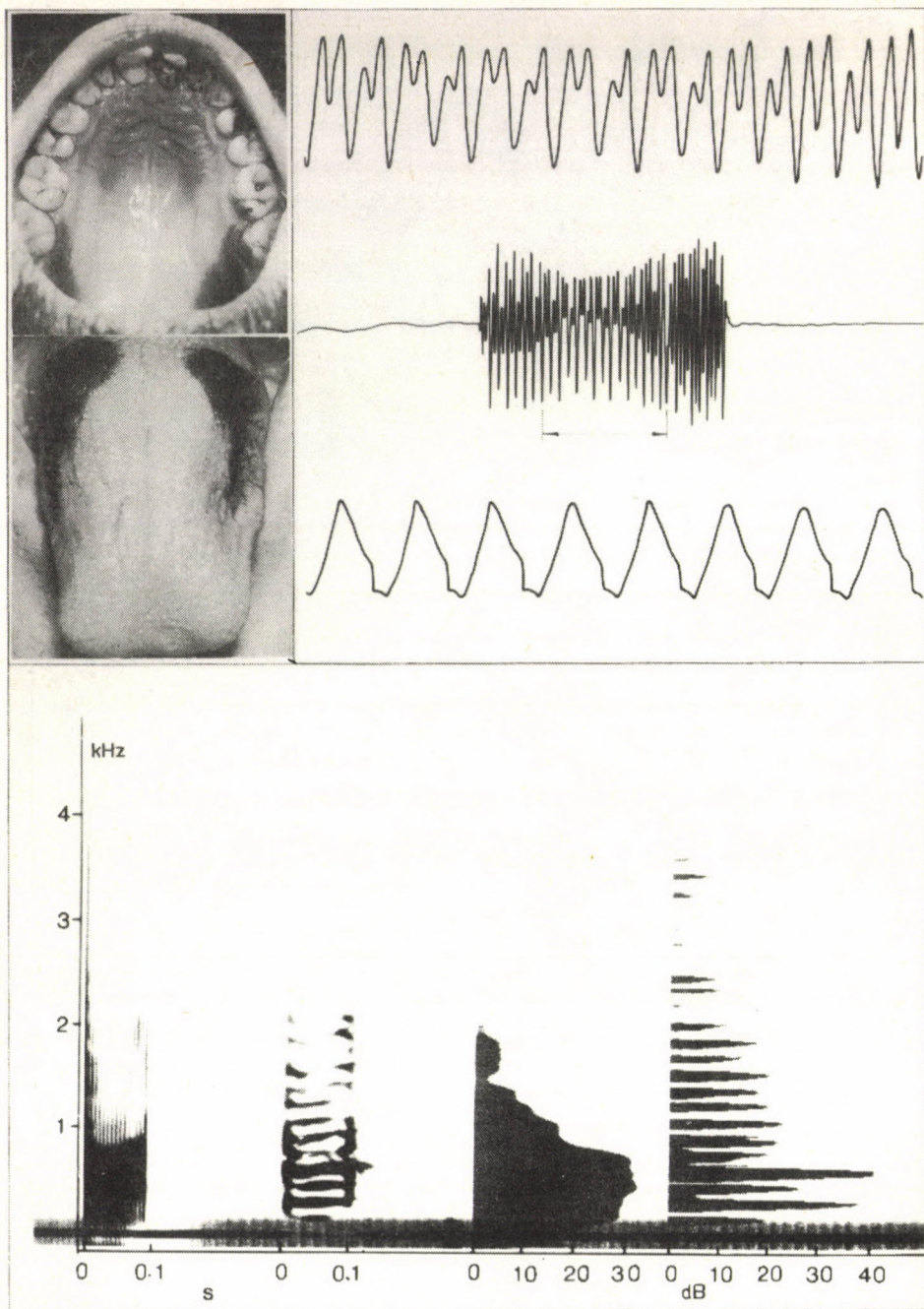


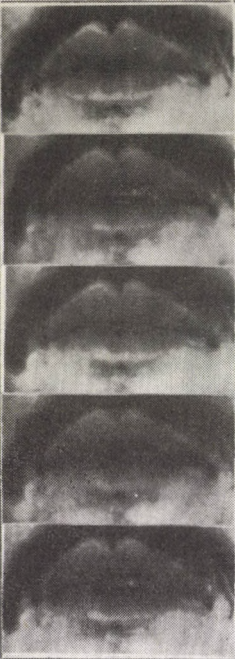
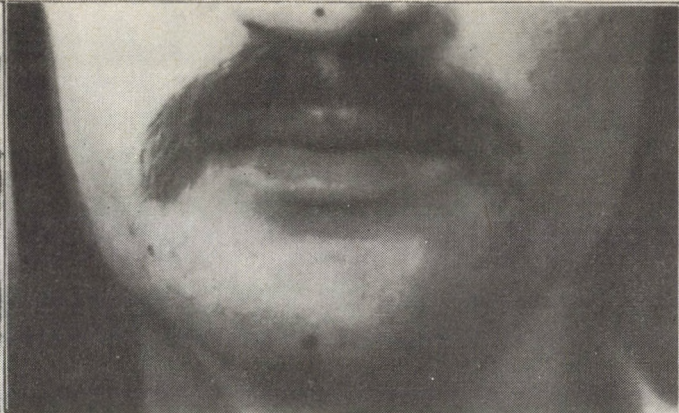
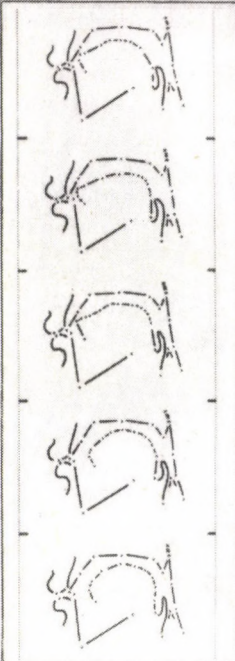
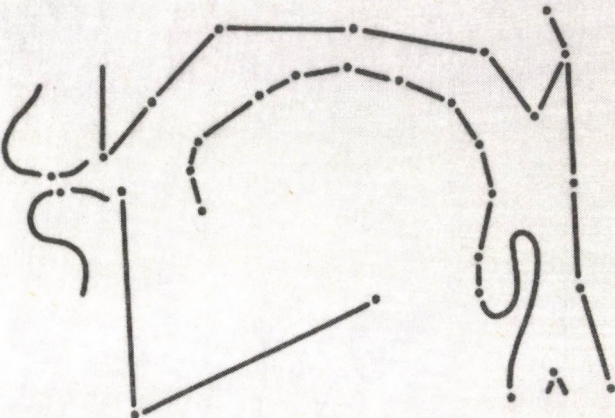


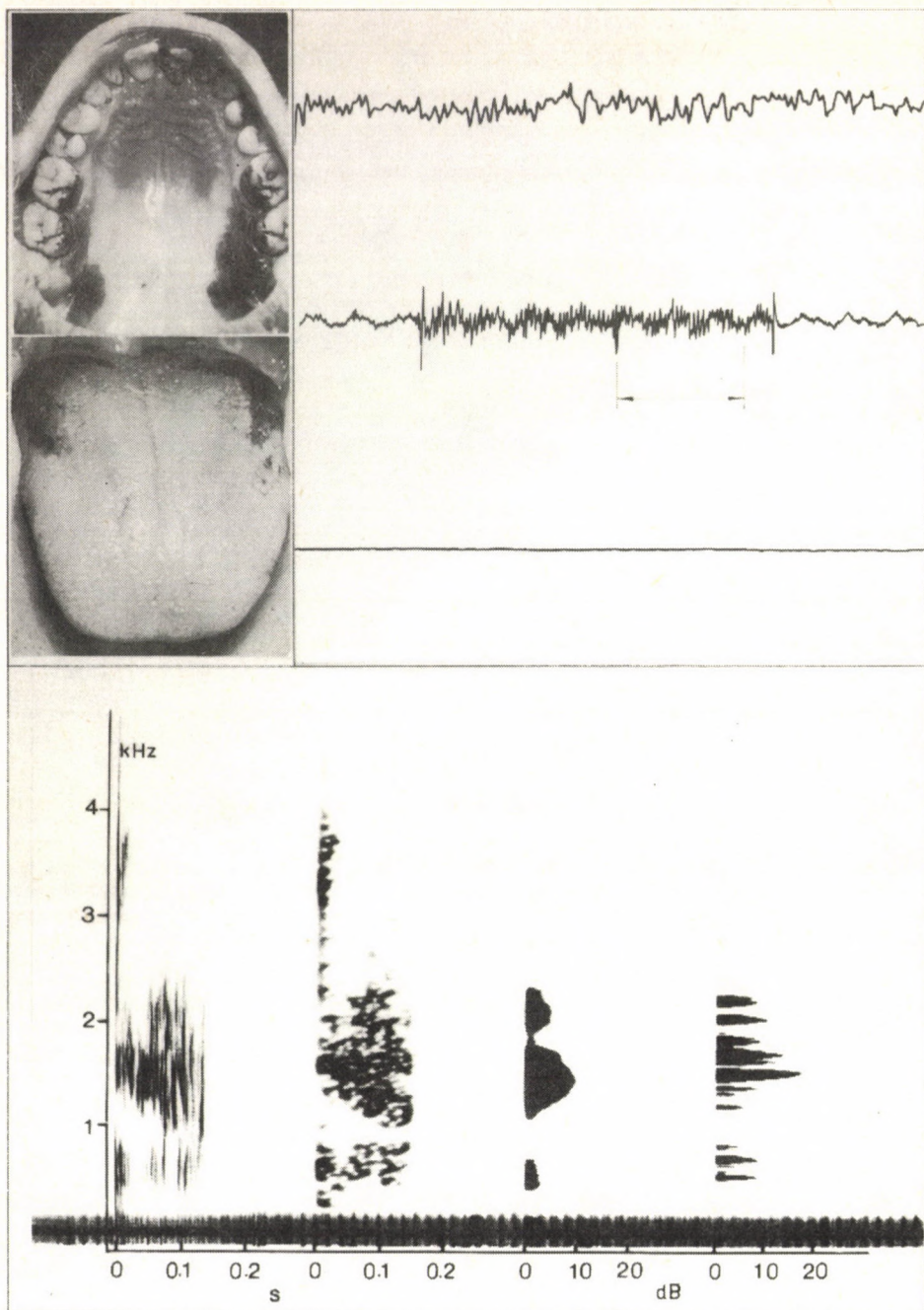
	 <div data-bbox="560 582 946 815"> <p>[ɛ̃] [m'ɛ̃ʂɛn'] <i>mięsień</i> [ɛ̃] [m'ɛ̃ʂɛn']</p> </div> <div data-bbox="1049 636 1165 761"> <p>20</p> </div>
	



	<p>[w] [m a w a]</p> <p><i>ma<u>t</u>a</i></p> <p>[u] [ma <u>u</u>a]</p> <p style="font-size: 2em; float: right;">21</p>



	
	<div data-bbox="551 555 912 799"> <p>[w] [ʃet w] <i>szedł</i> [ɯ] [šet ɯ]</p> </div> <div data-bbox="1018 613 1135 732"> <p>22</p> </div> 



2. Consonants / Spółgłoski

Manner of articulation \ Place of articulation		bi-labial		labio-dental		denti-alveo.		alveo-lar		post-alveol.		alveo-prepal.		pre-medio-palatal		palato-velar		velar	
		h	s	h	s	h	s	h	s	h	s	h	s	h	s	h	s	h	s
		vd	b	b'			d		d'				d'				g'	g	
Oral	Complete closure sounds	vl	p	p'			t		t'				t'				k'	k	
		vd	m	m'			n							n'			ŋ'	ŋ	
Nasal		vl	m				n							n'					
Oral	Rolled sounds	vd						r					r'						
		vl						r					r'						
	Fricatives	vd			v	v'		z		ʒ	ʒ'		z'		ʒ		j	ʃ	ʃ'
		vl			f	f'		s		ʃ	ʃ'		s'		ʃ		ch	ch	
	Laterals	vd						l					l'						
		vl						l											
	Affricates	vd					dʒ						dʒ						
		vl					tʃ	tʃ'					tʃ						

The classification of Polish consonants according to their articulatory features

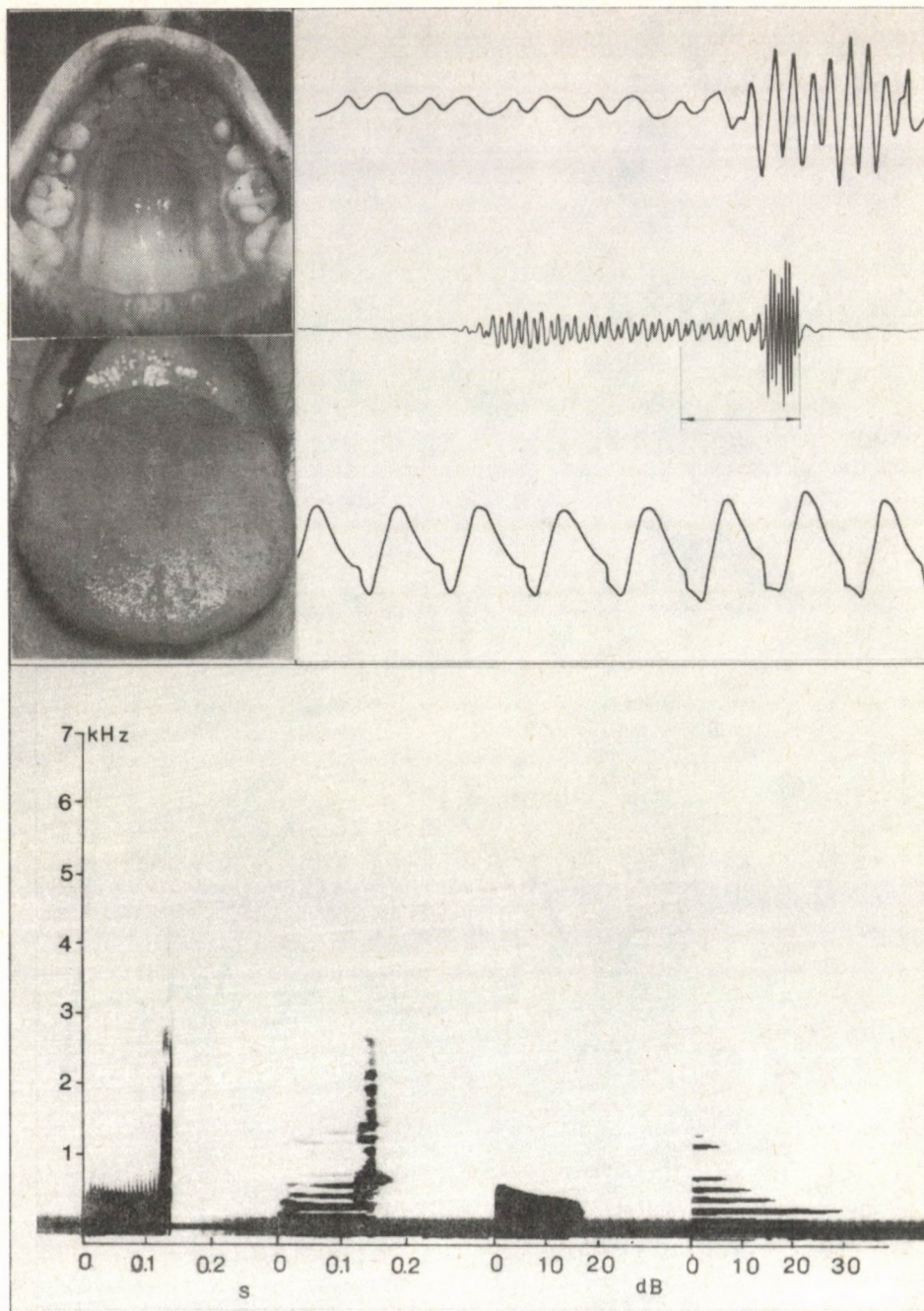
vd = voiced, vl = voiceless, h = hard, s = soft

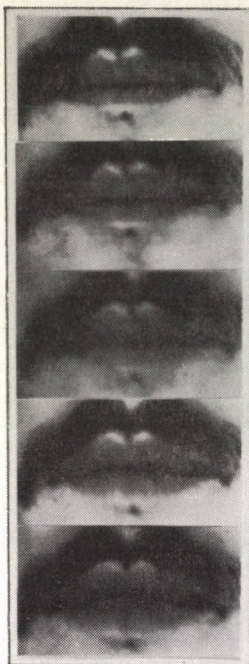
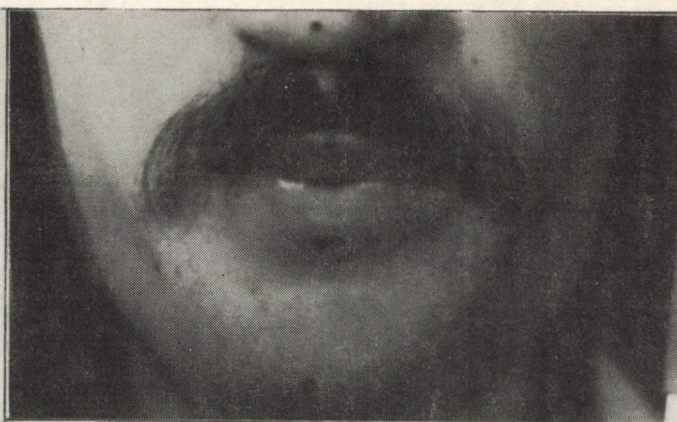
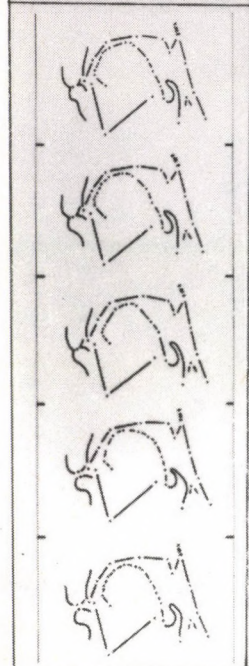
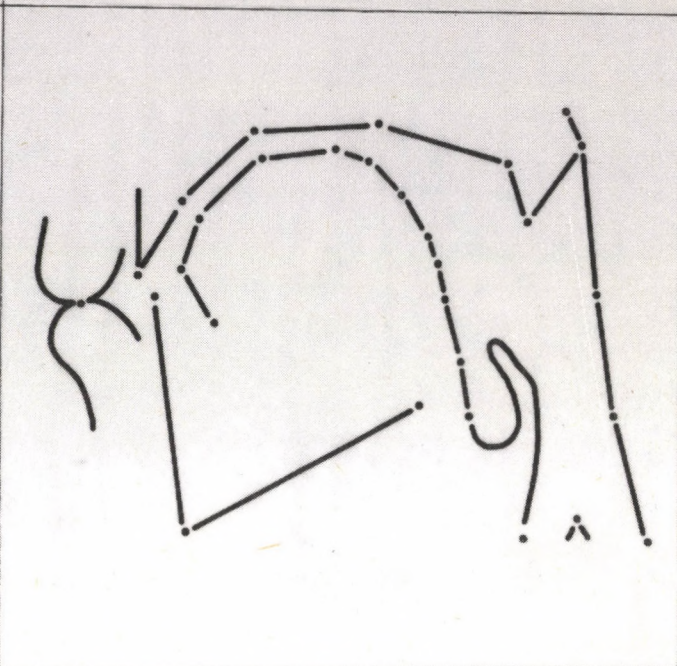
[b] [bawɪ]

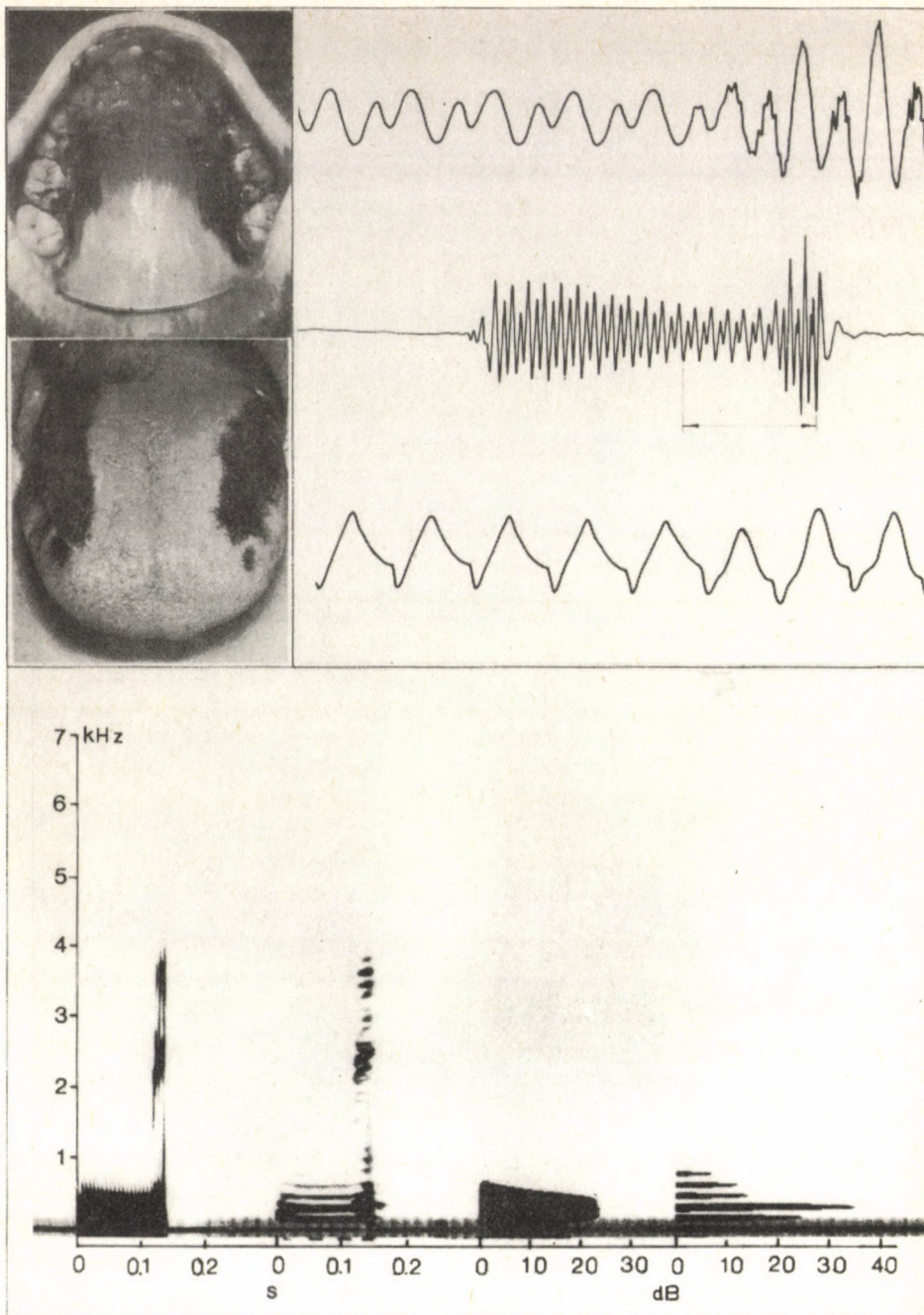
baɥ

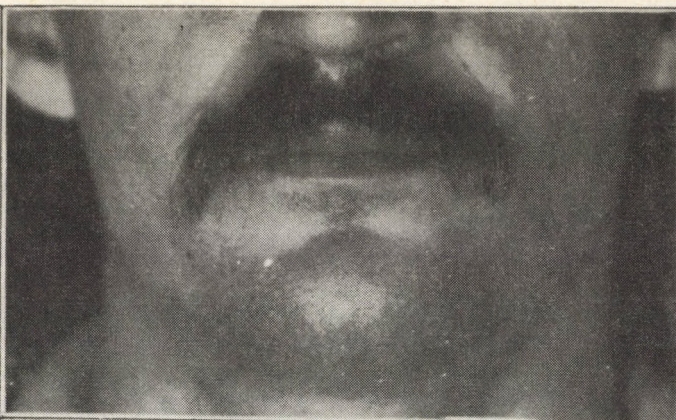
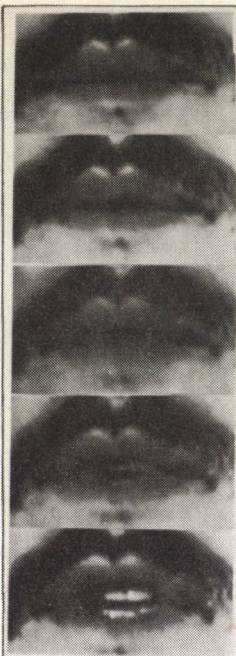
[b] [baɥɥ]

23



	 <div data-bbox="528 573 901 815"> <p>[b] [b'i l'i]</p> <p><i>bili</i></p> <p>[b] [b'i l'i]</p> </div> <div data-bbox="1017 627 1146 770"> <p>24</p> </div>
	



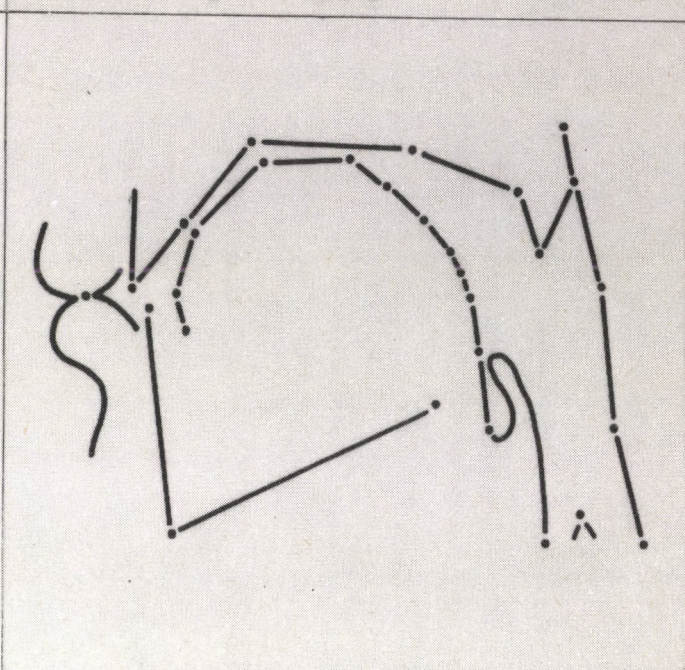
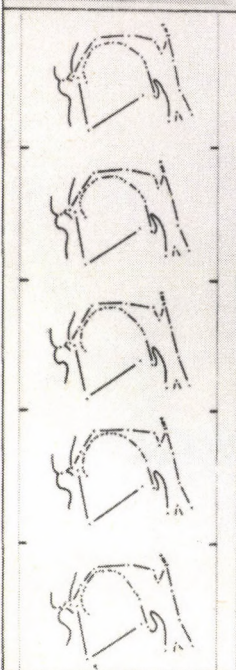


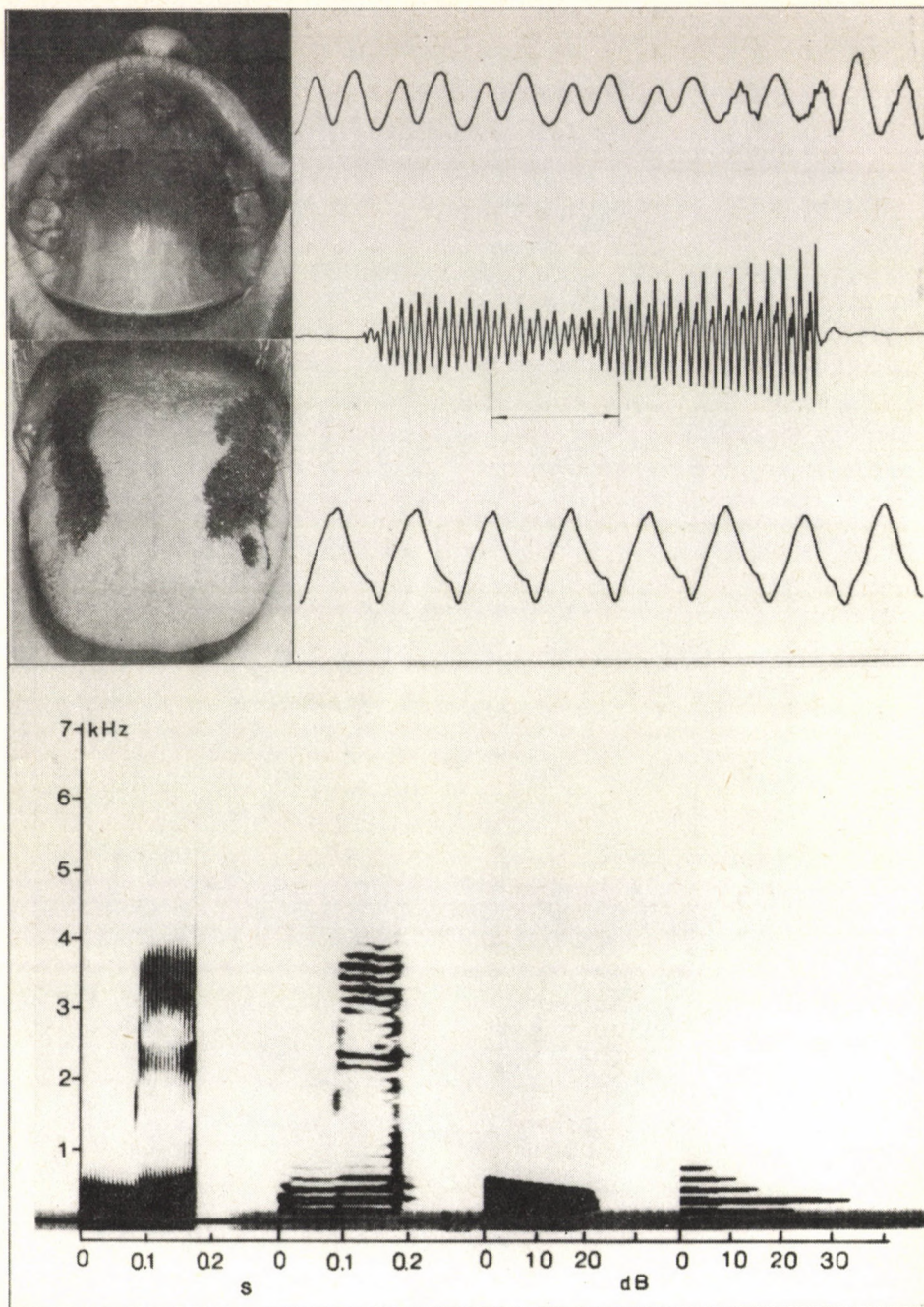
[b'] [b'æwɨ]



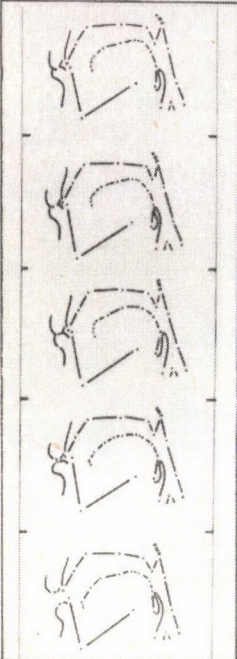
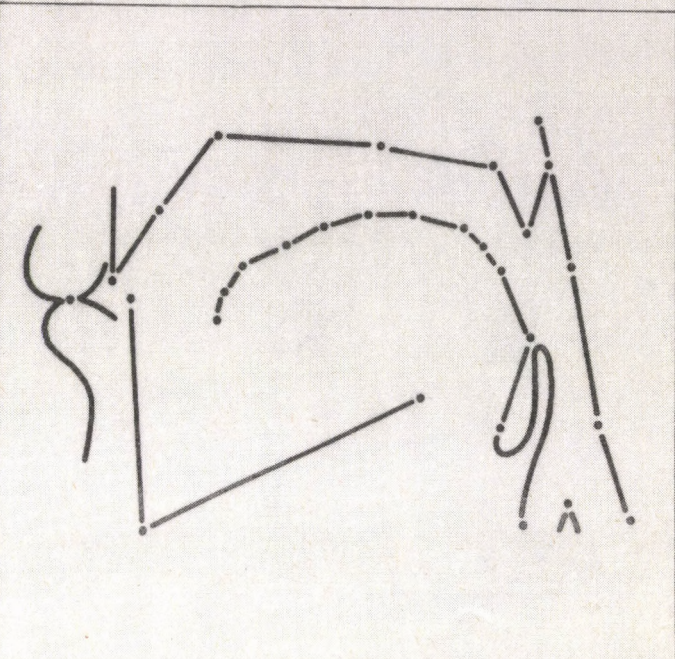
biały

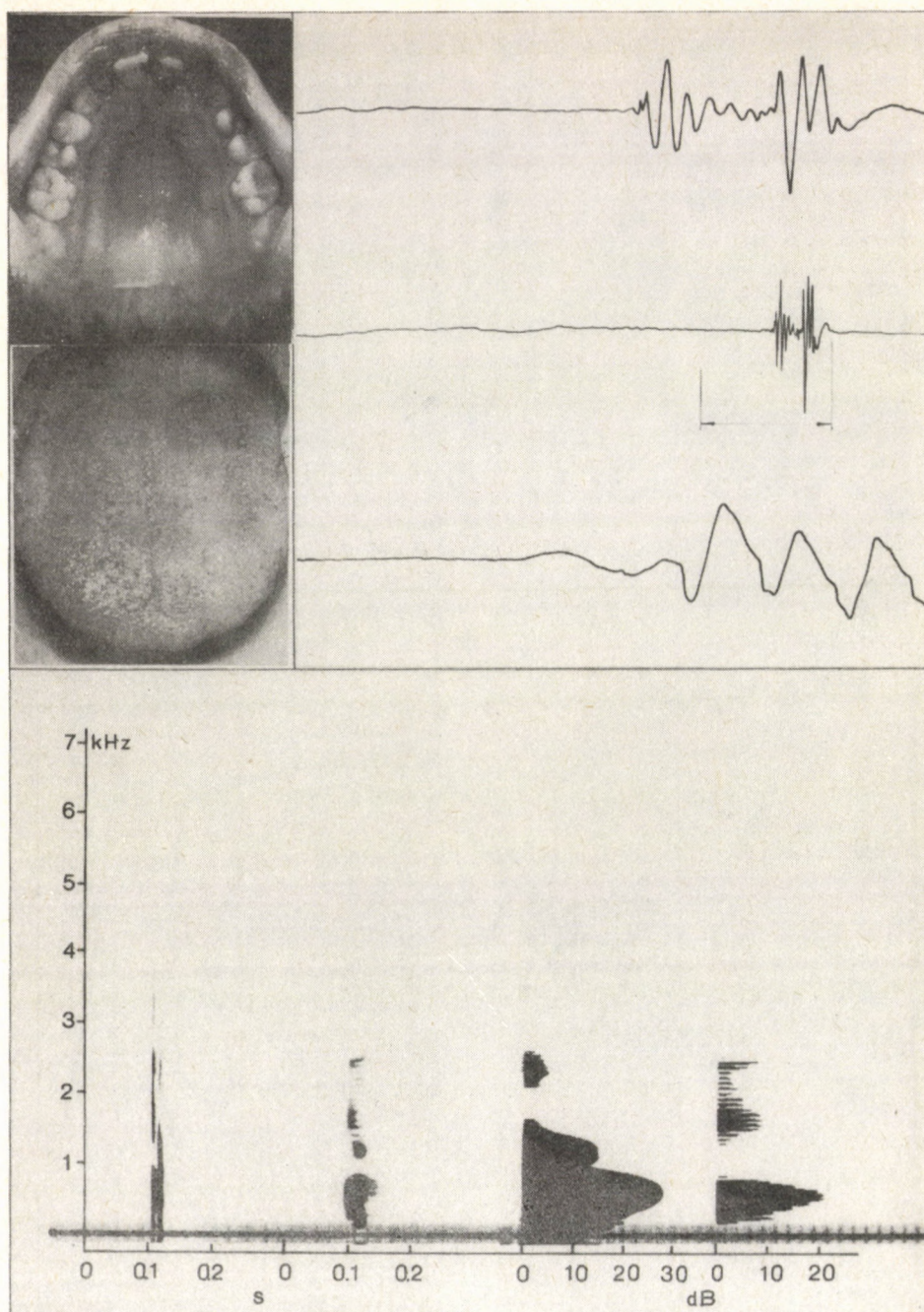
[b'] [b'äuy]

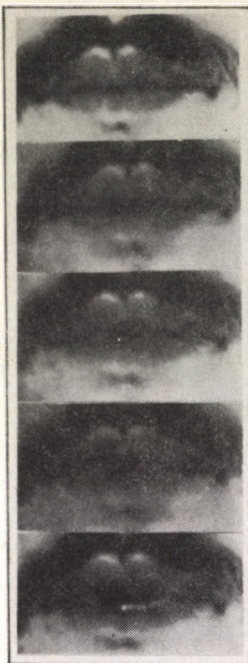
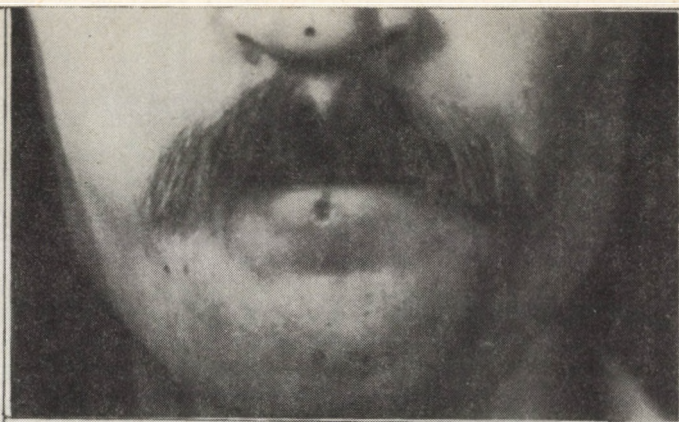
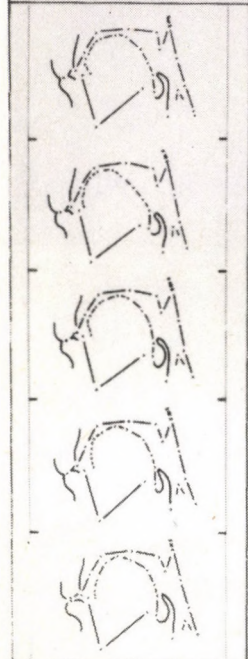
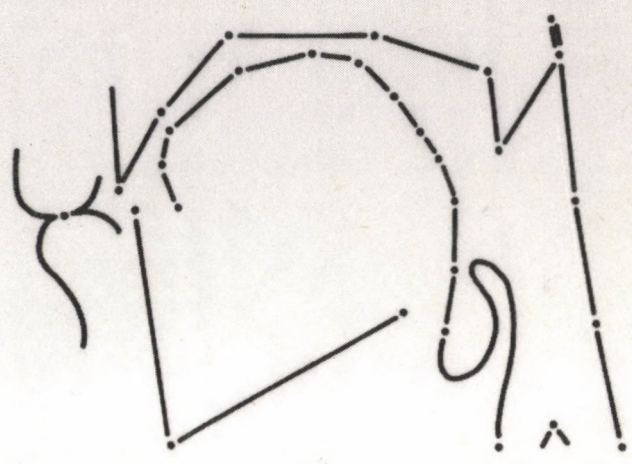
25

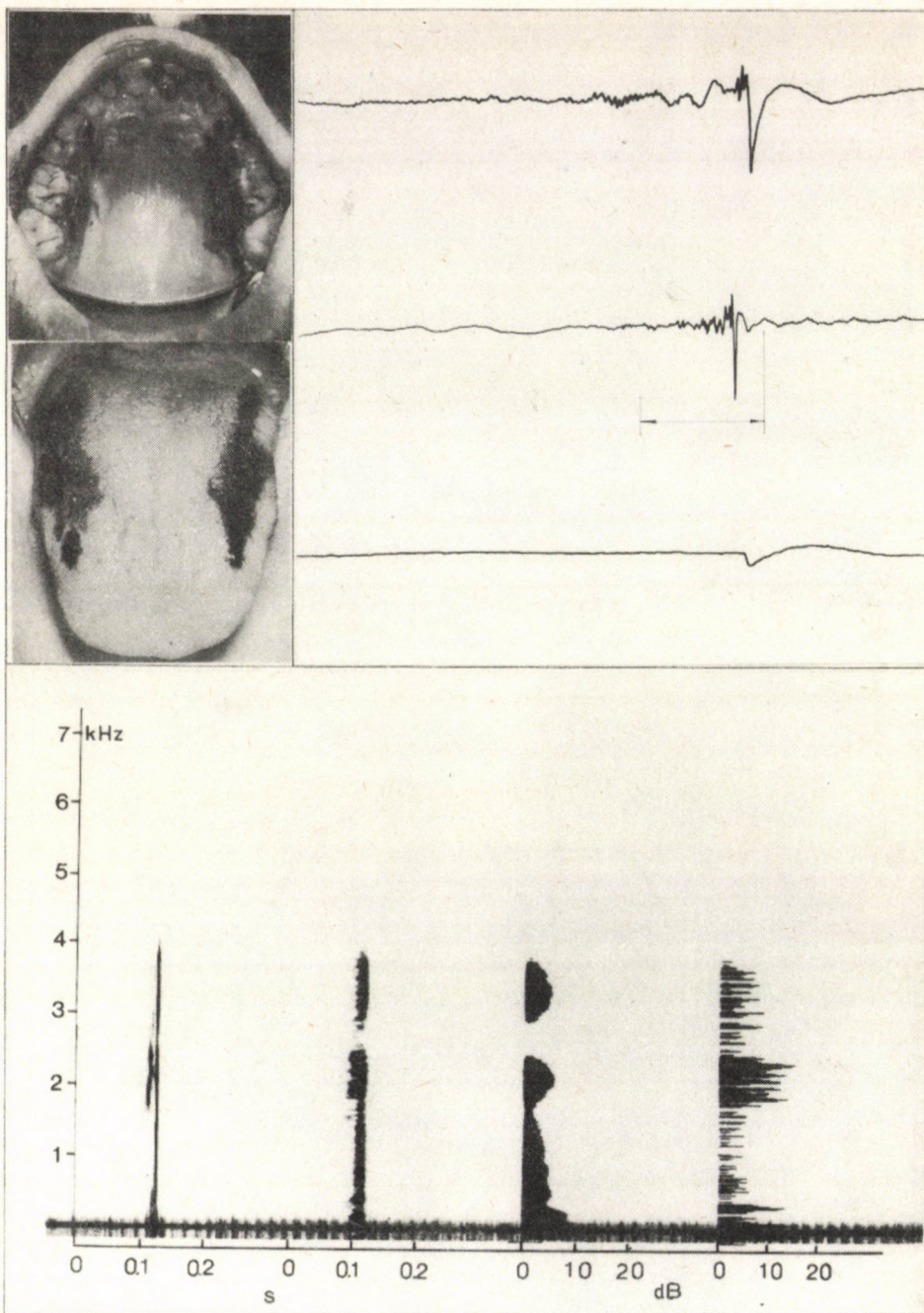




	
	<p>[p] [pasek]</p> <p>pasek</p> <p>[p] [pasek]</p> <p style="font-size: 2em; font-weight: bold;">26</p>
	



	
	<div data-bbox="529 573 869 806"> <p>[p'] [p'il'i]</p> <p><i>pili</i></p> <p>[p'] [p'il'i]</p> </div> <div data-bbox="982 627 1096 752"> <p>27</p> </div> 



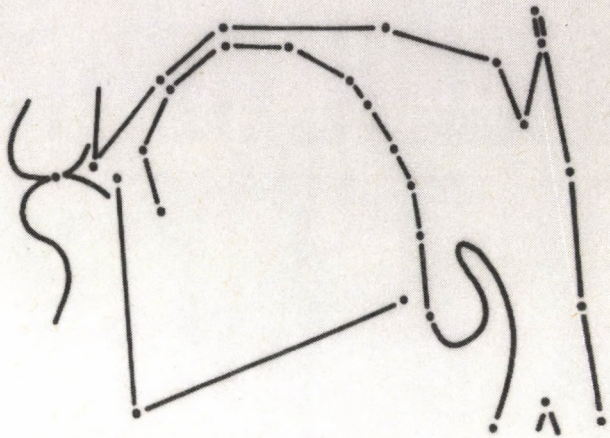
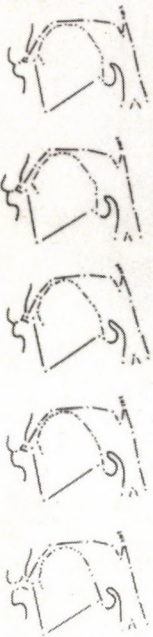


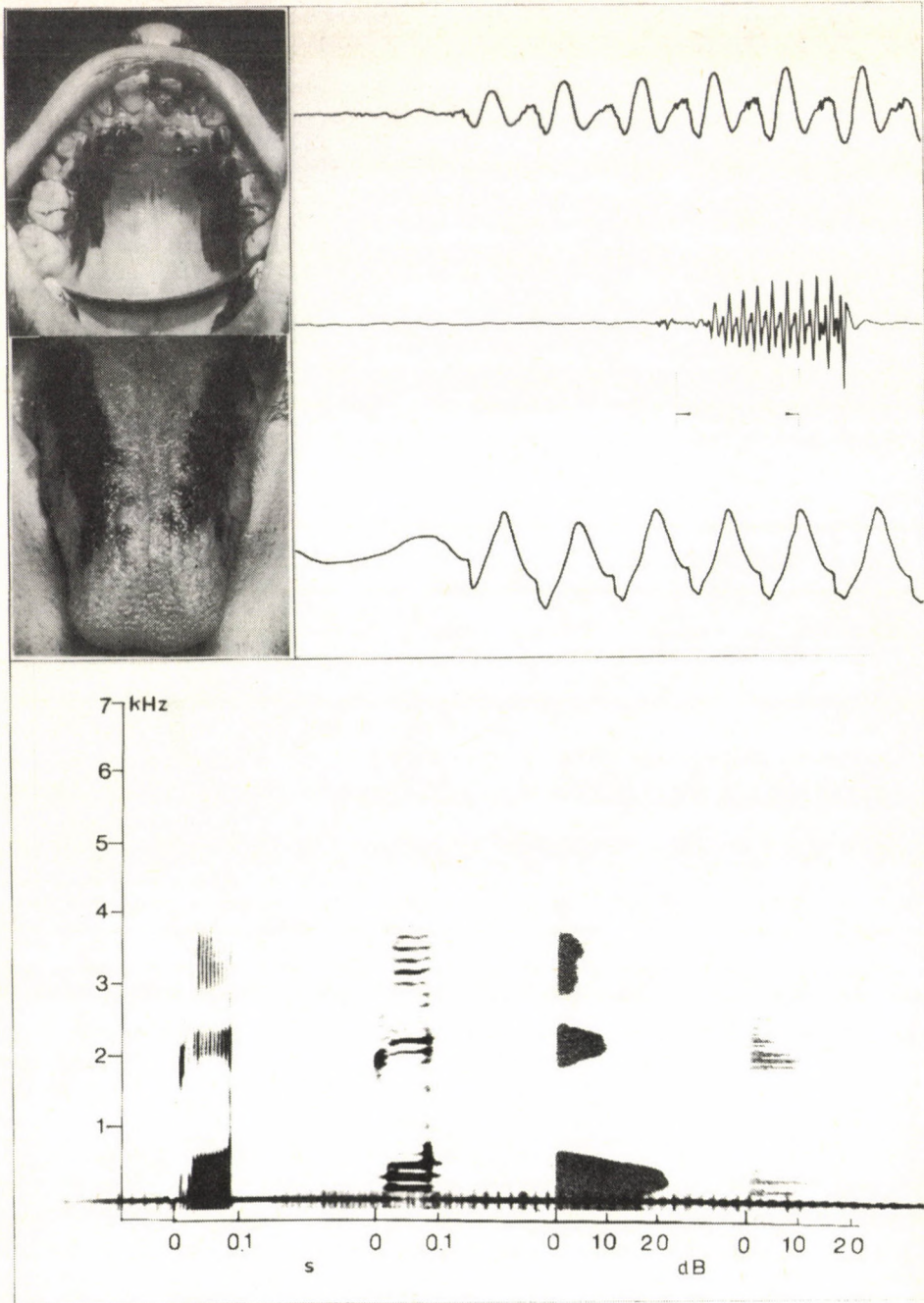
[p'] [p'æsek]

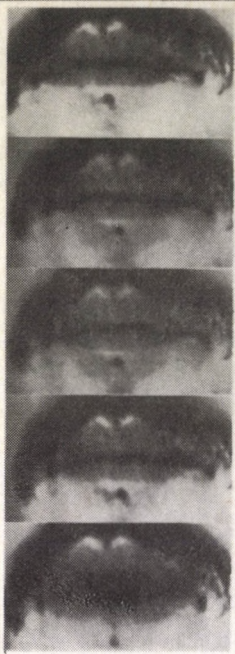
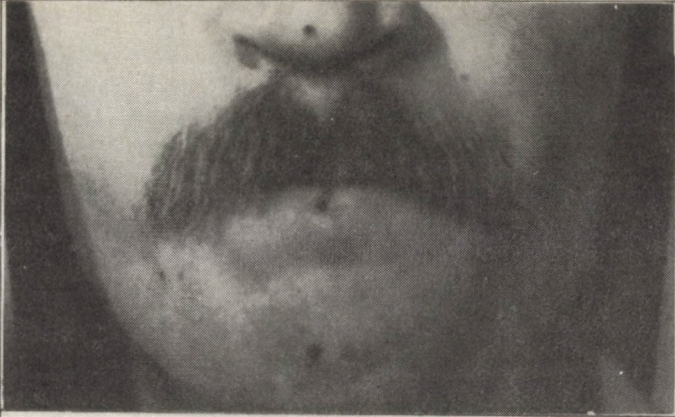
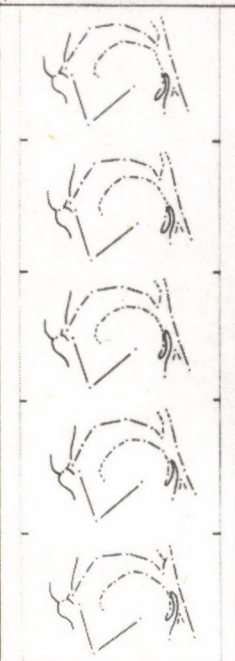
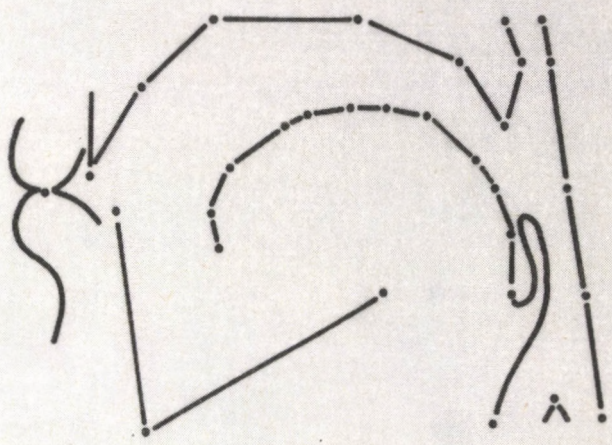
piasek

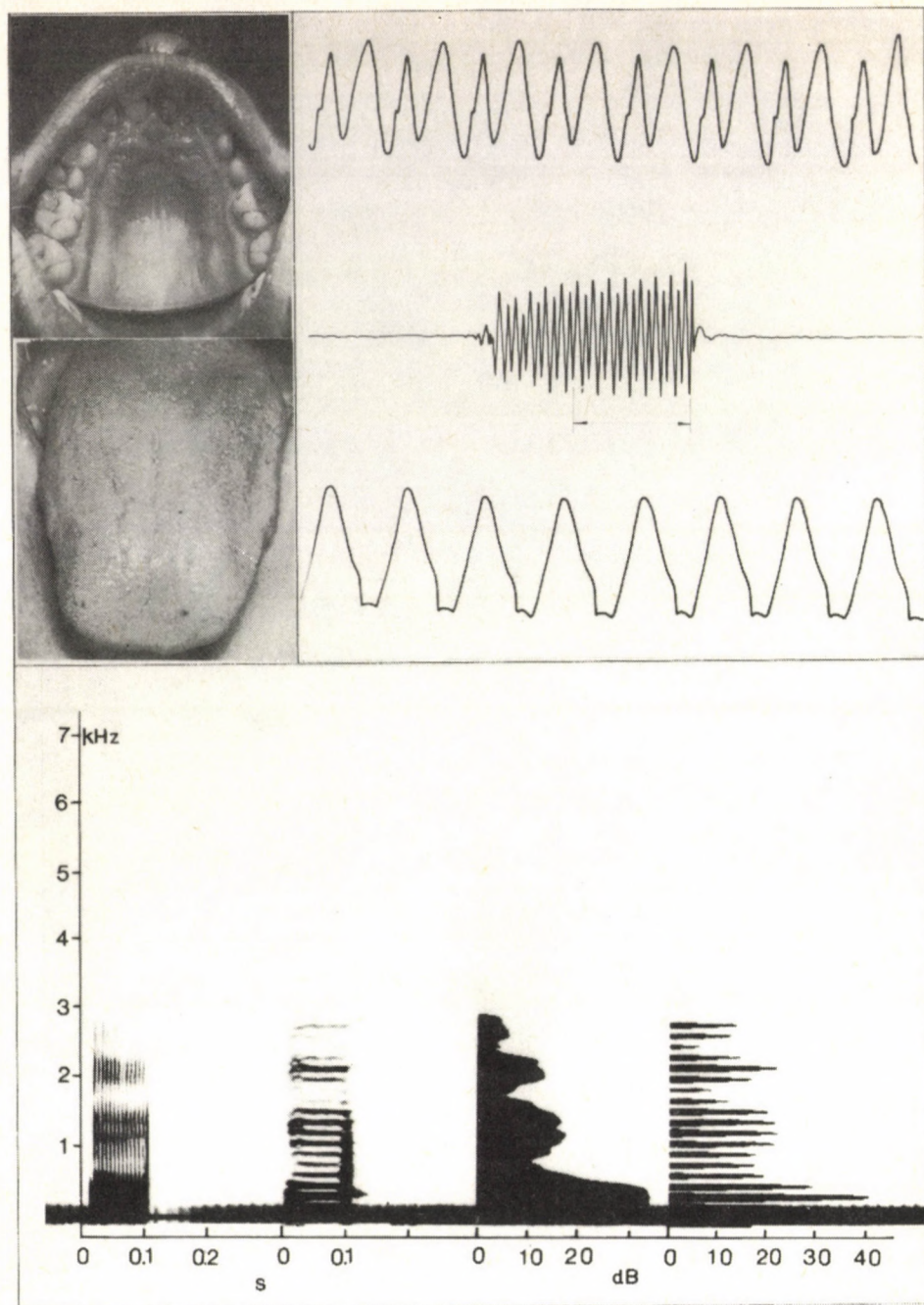
[p'] [p'äsek]

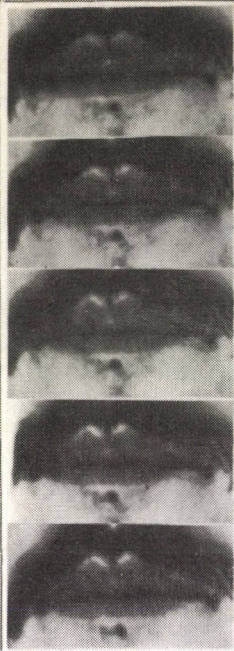
28





	
	<div data-bbox="535 560 907 795"> <p>[m] [mawa] mata [m] [maɥa]</p> </div> <div data-bbox="995 617 1108 740"> <p>29</p> </div> 



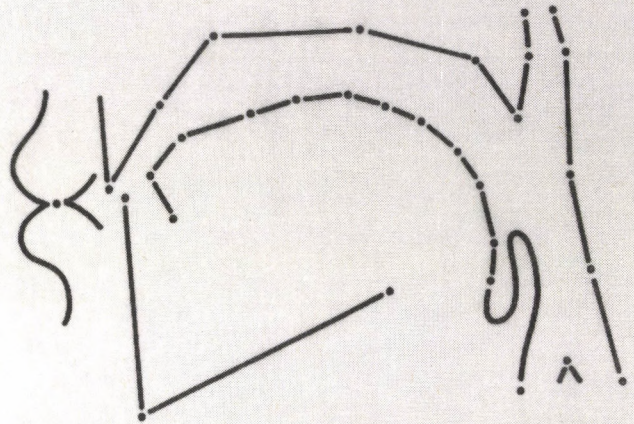


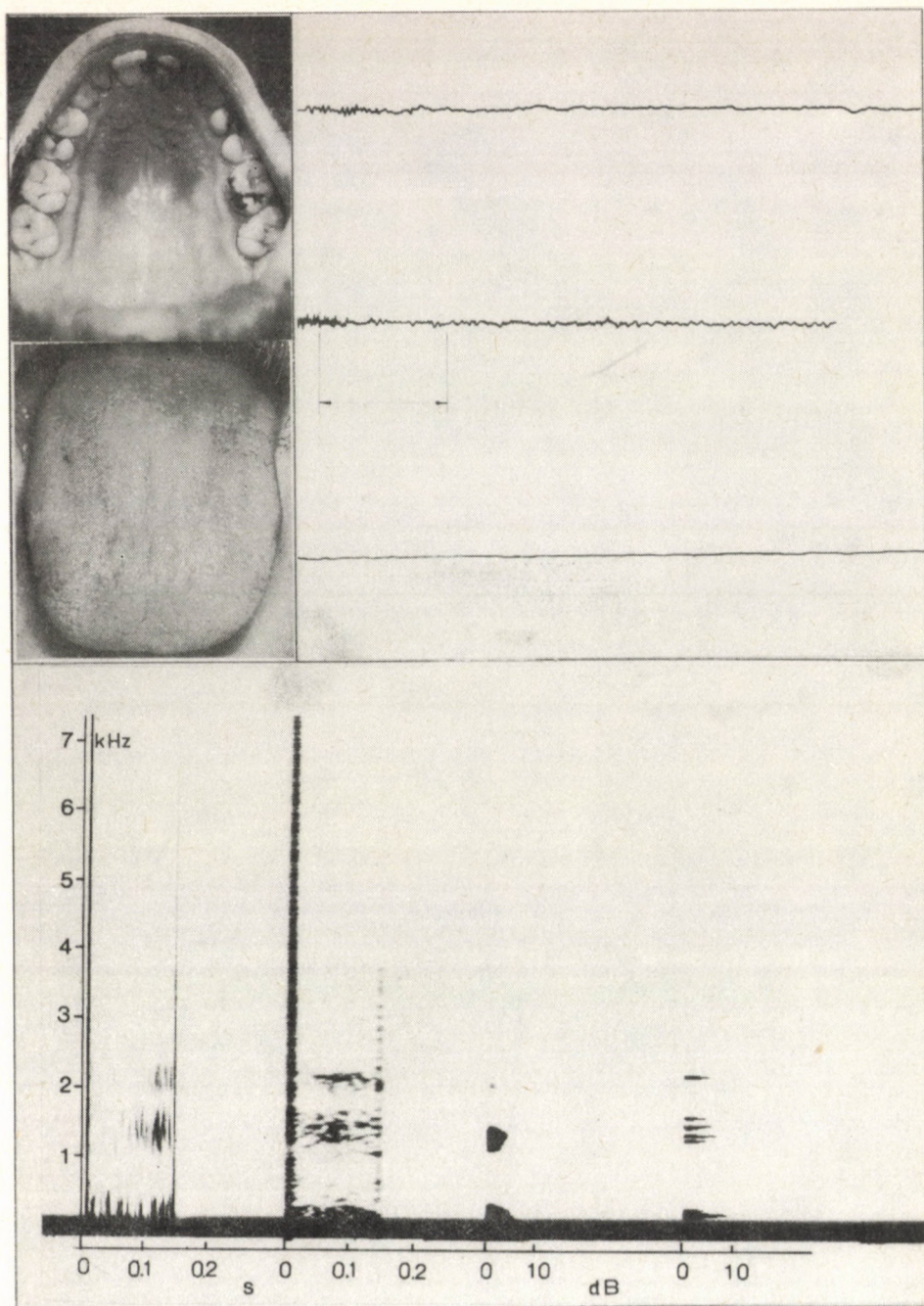
[m] [pas₀m]

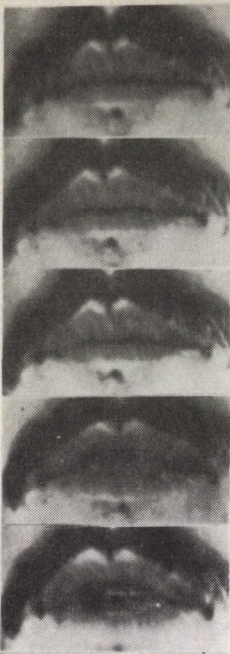

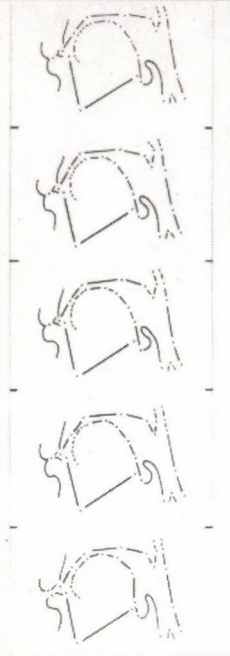
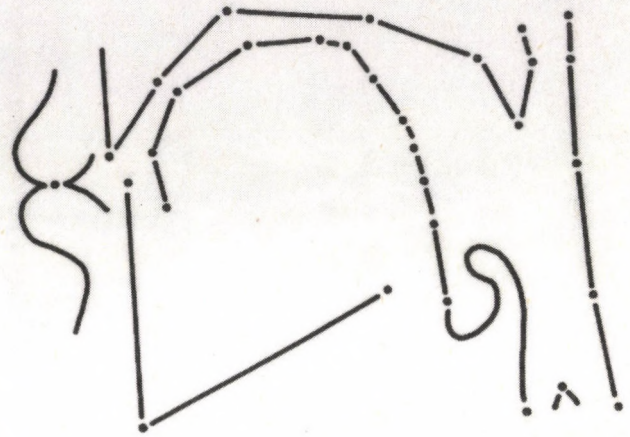
pas₀m

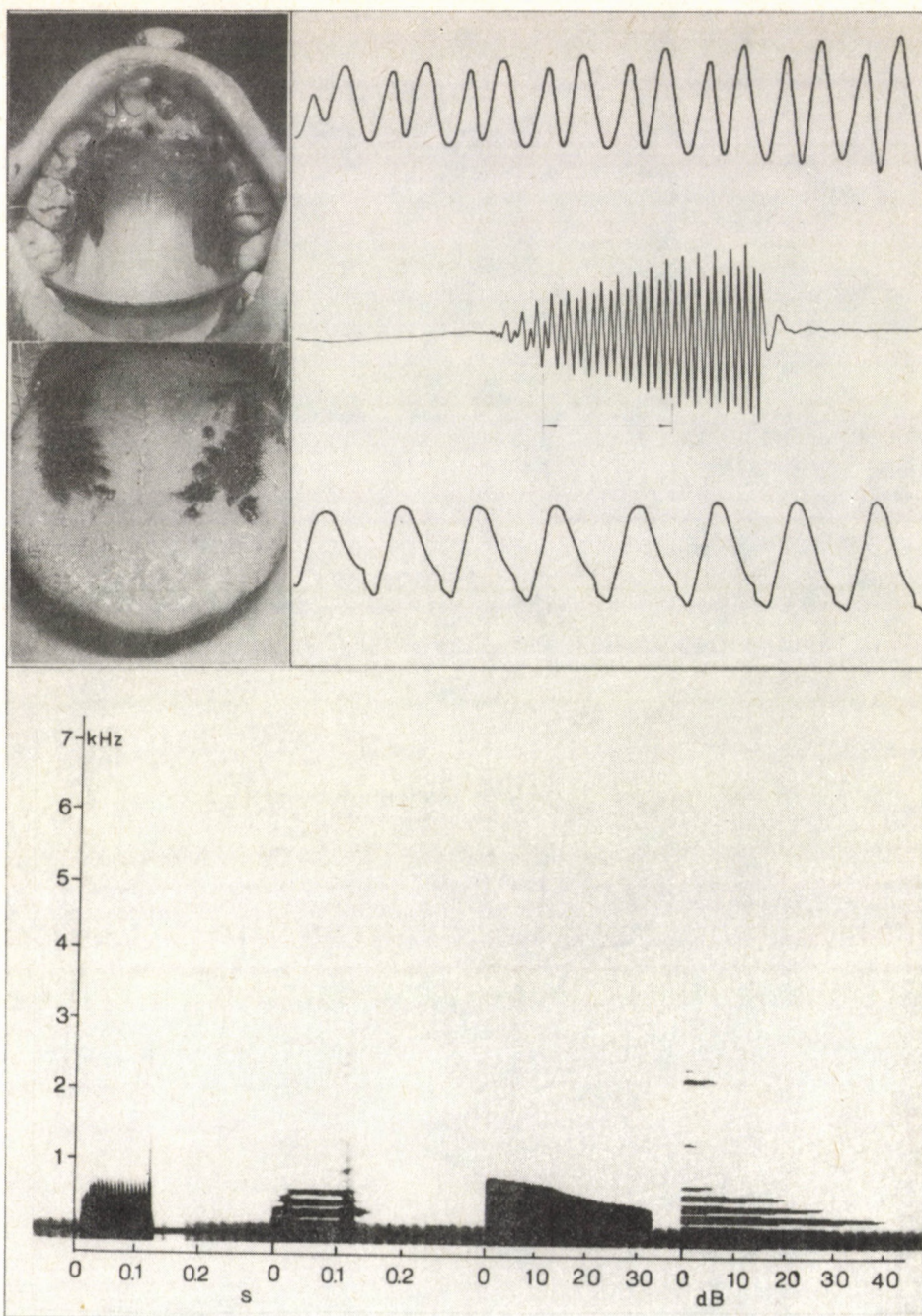
[ṃ] [pas₀ṃ]

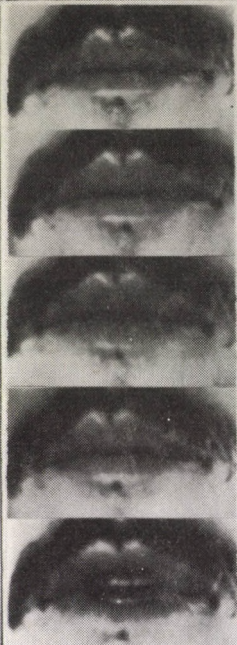
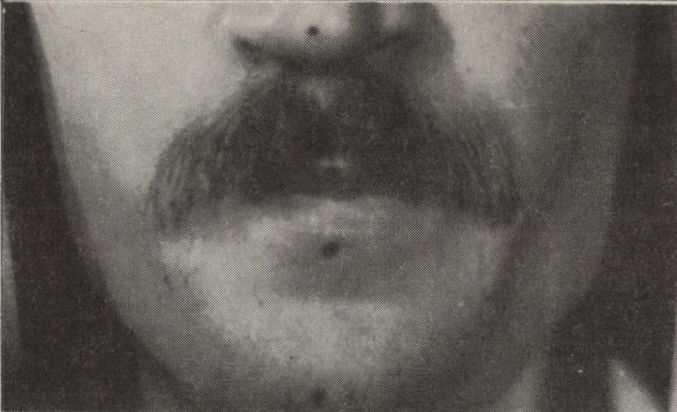
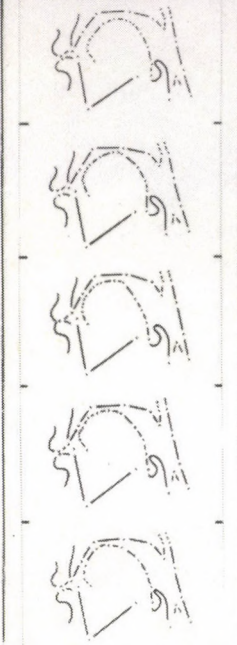
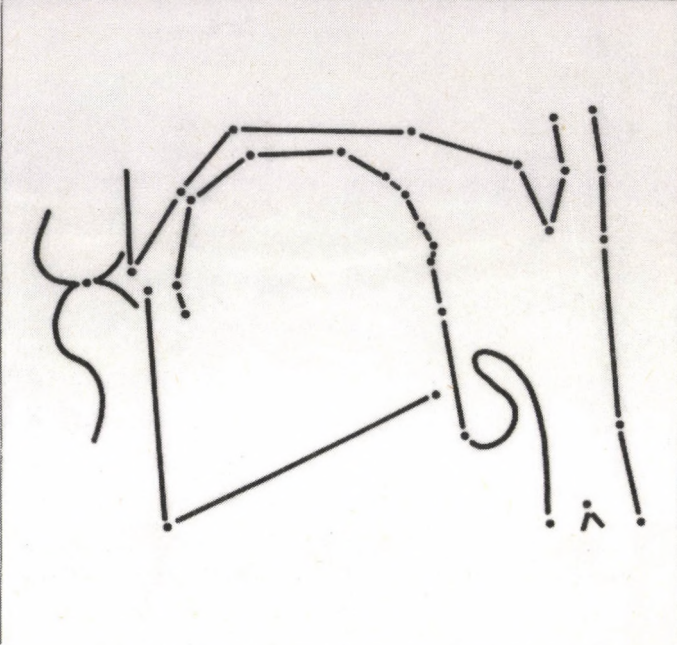
30

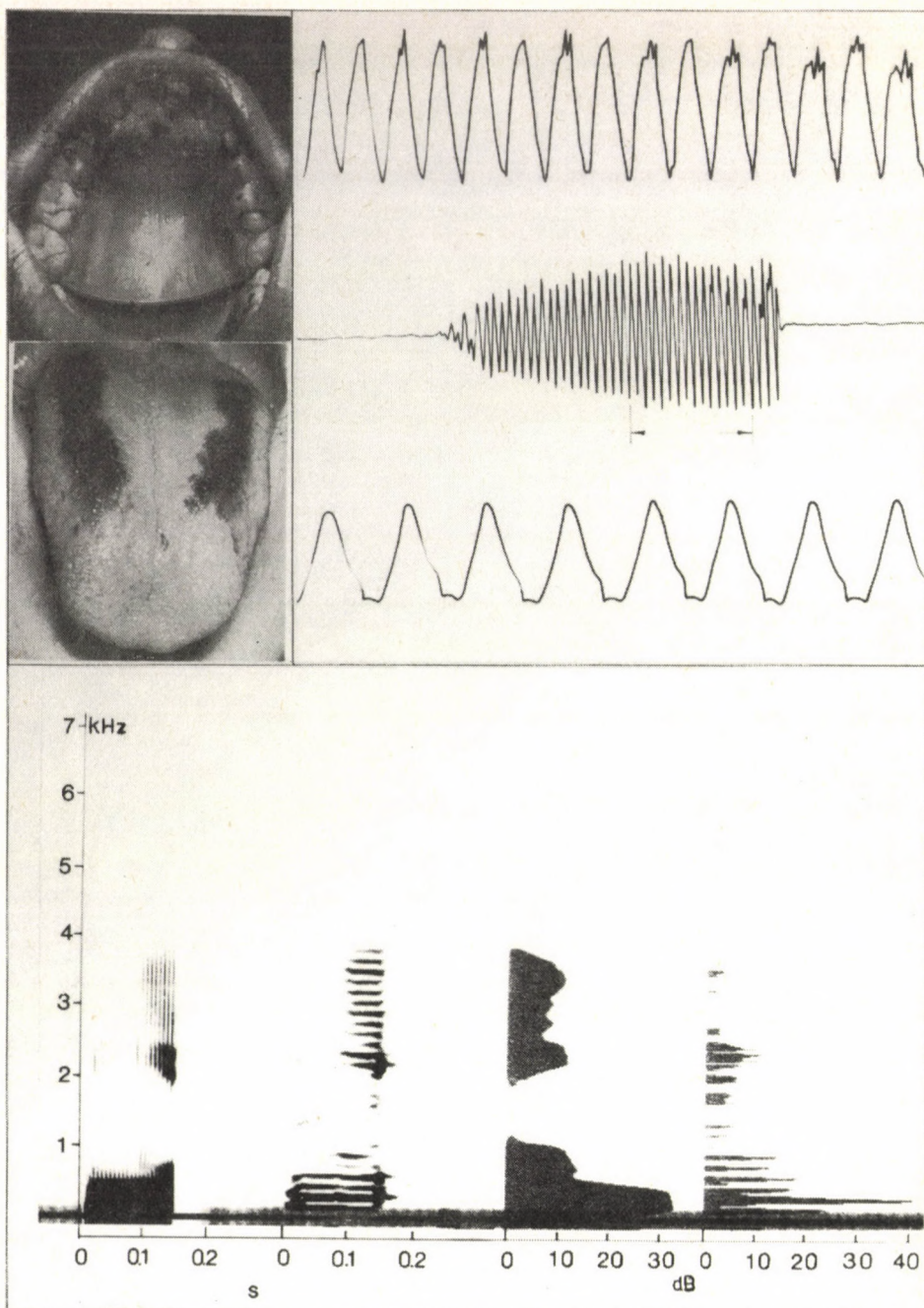


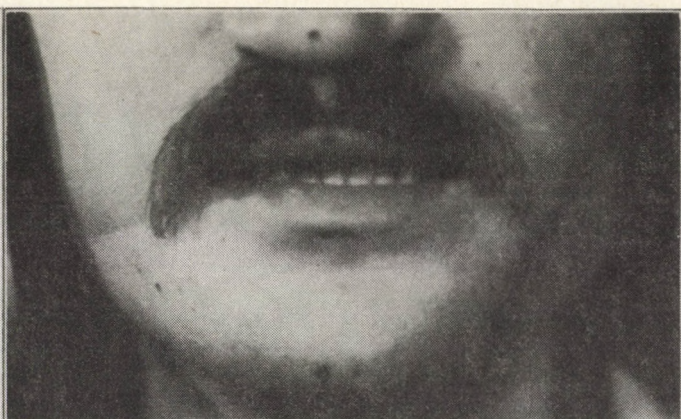
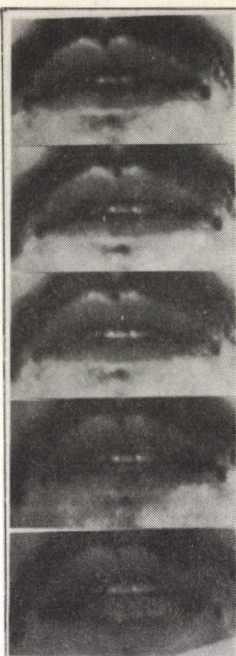


	
	<div data-bbox="510 575 888 809"> <p>[m'] [m'æwa]</p> <p><i>miaka</i></p> <p>[m'] [m'äya]</p> </div> <div data-bbox="982 627 1089 761"> <p>31</p> </div> 



	
	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>[m'] [m' i ɕ]</p> <p> <i>miś</i></p> <p>[m'] [m' i ś]</p> </div> <div style="font-size: 2em; font-weight: bold;">32</div> </div>
	



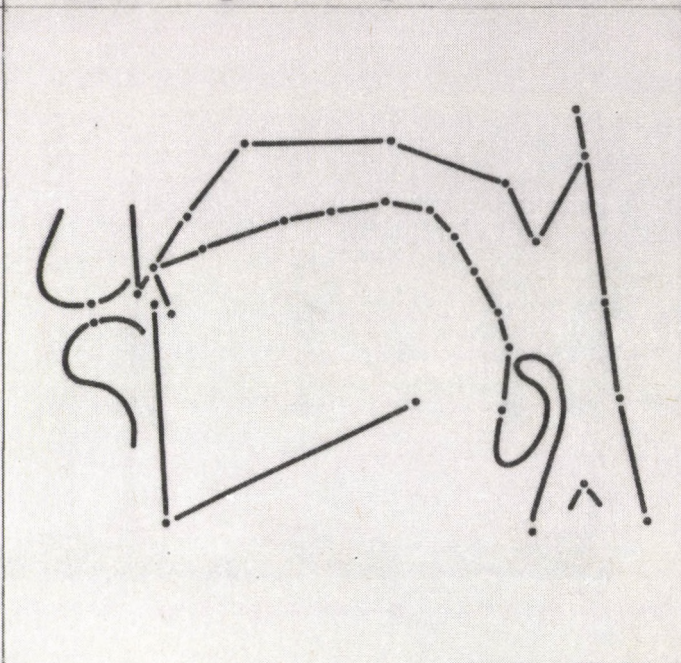
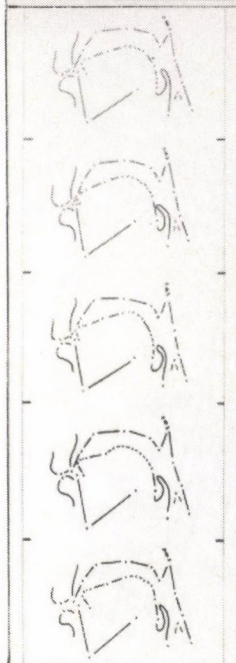


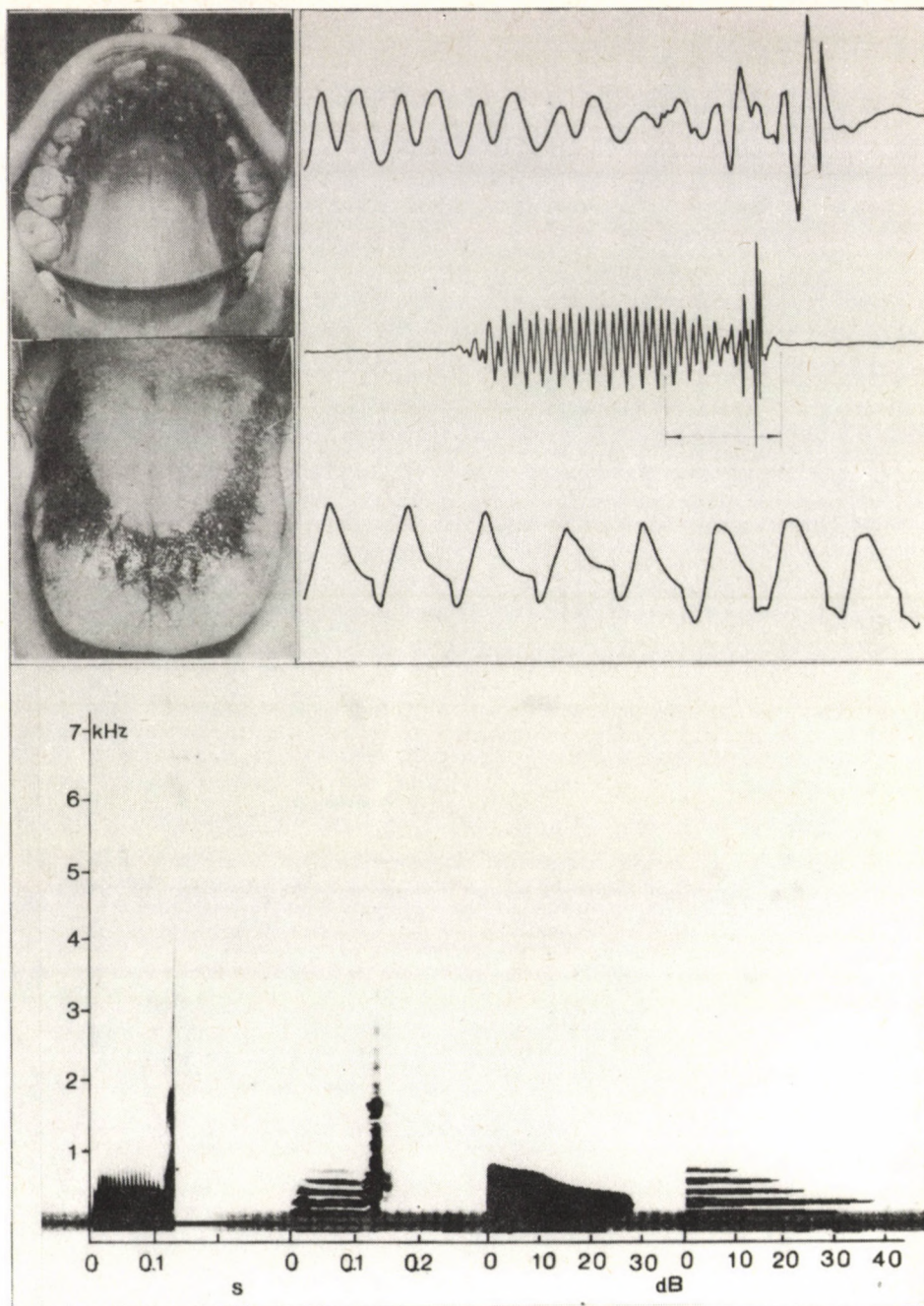
[d] [data]



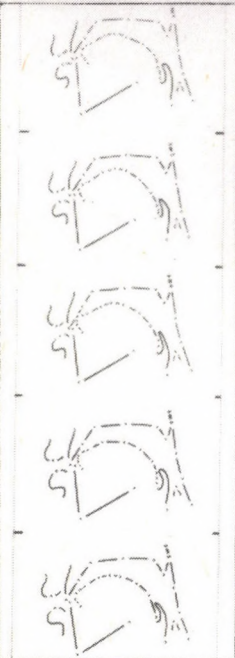
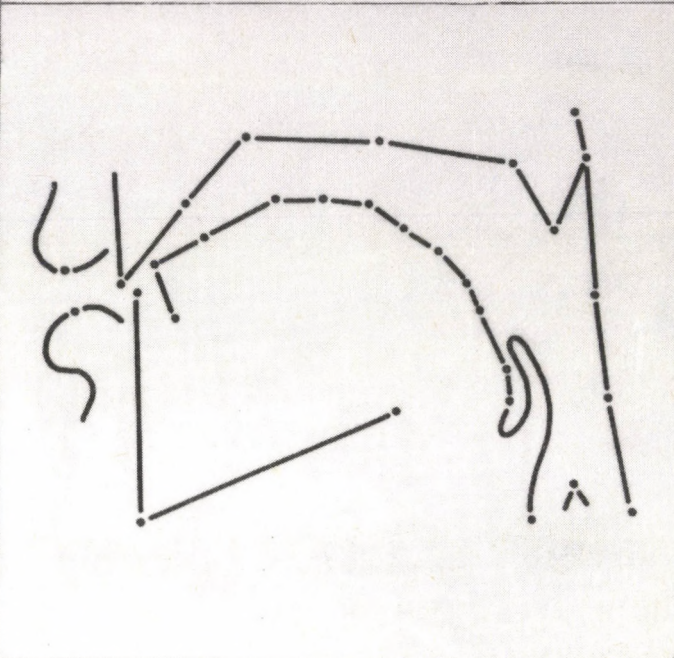
data

[d] [data]

33





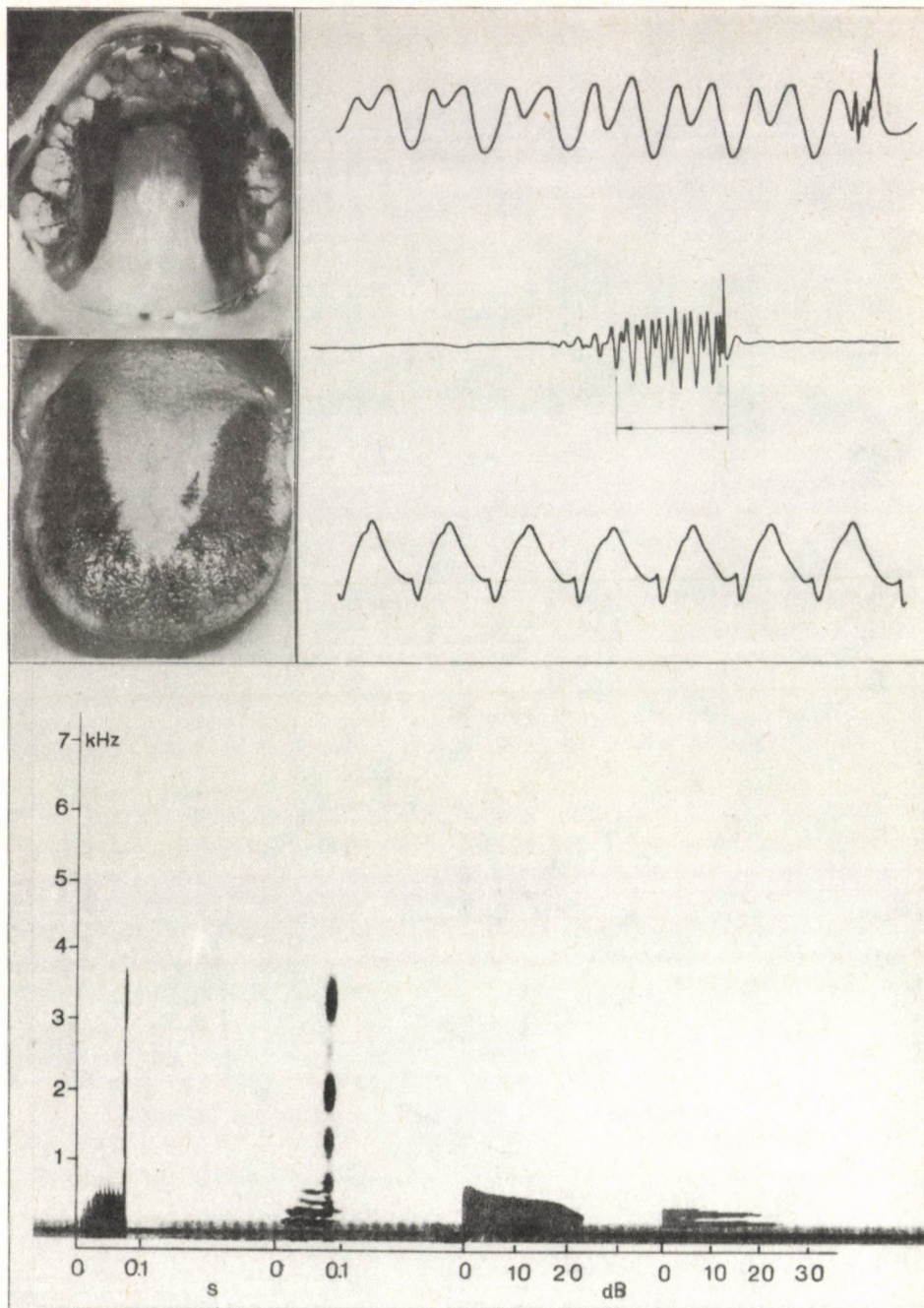
	
	

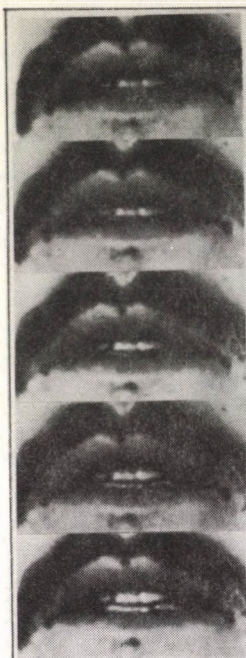
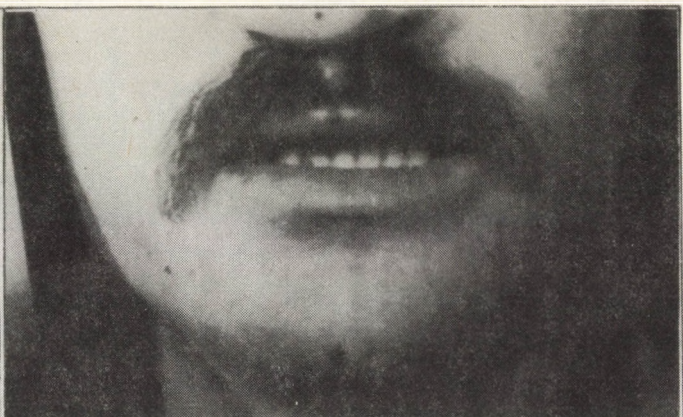
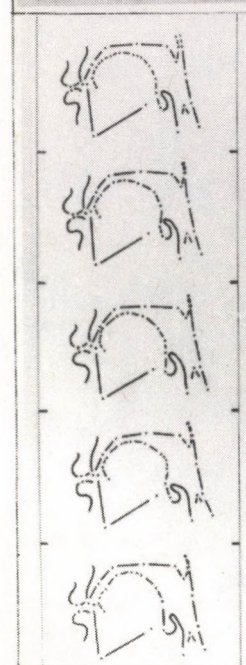
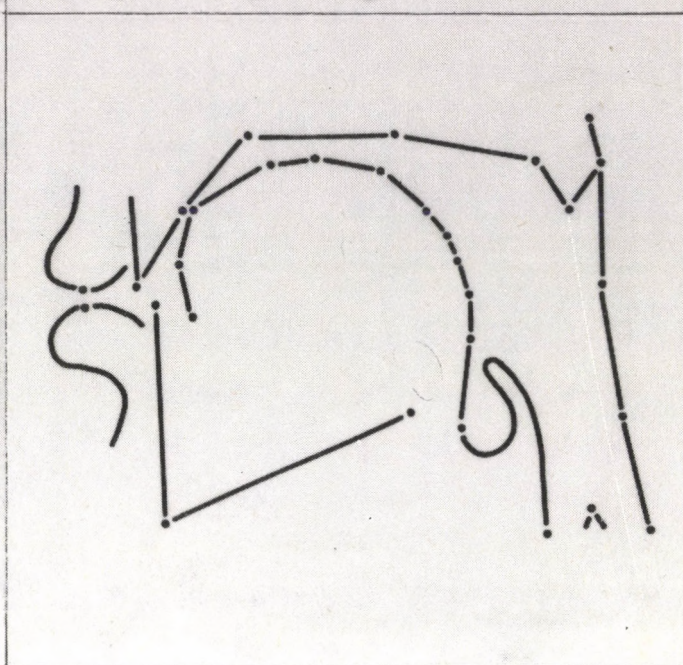
[ɖ] [ɖzevo]

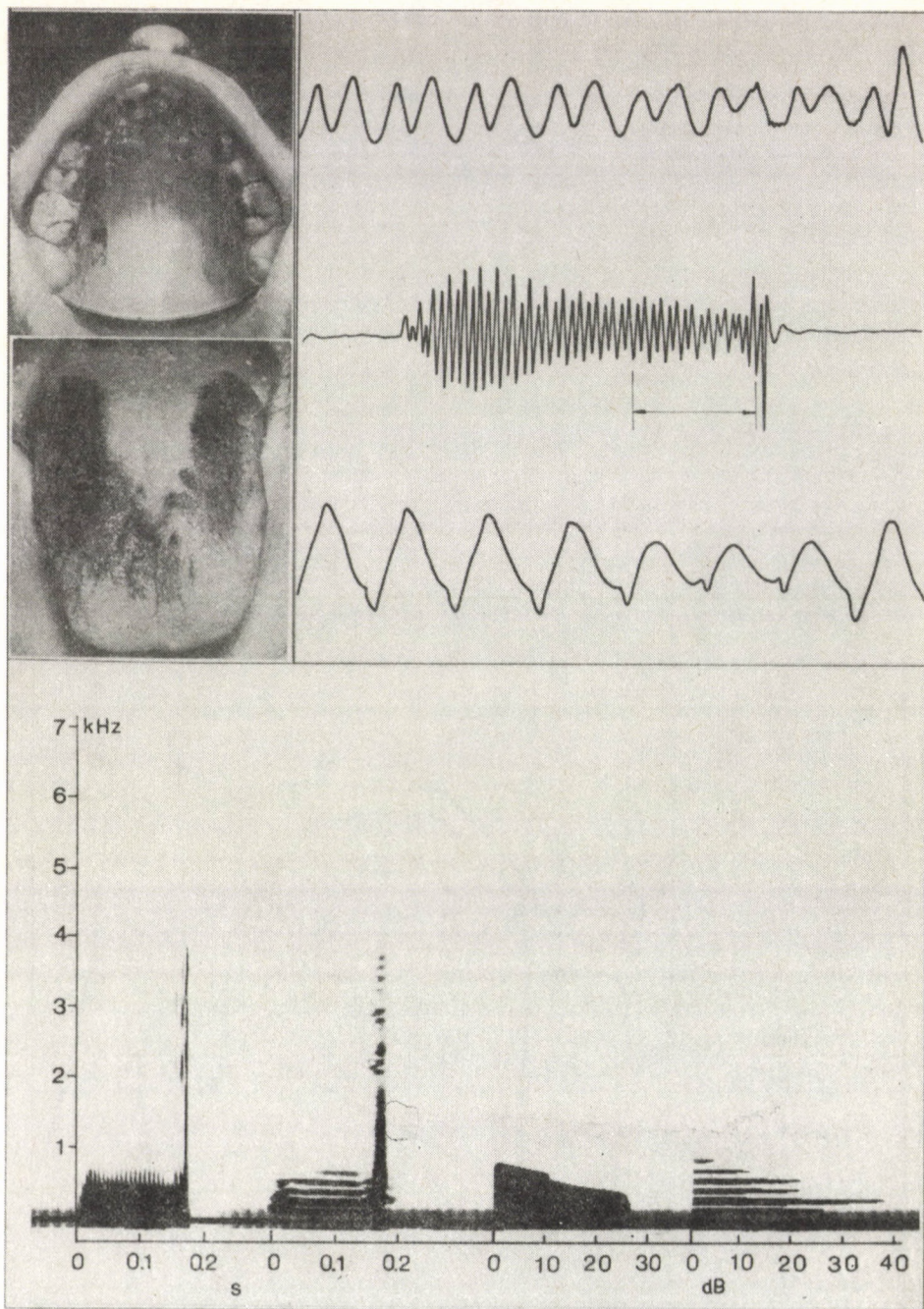
drzewo

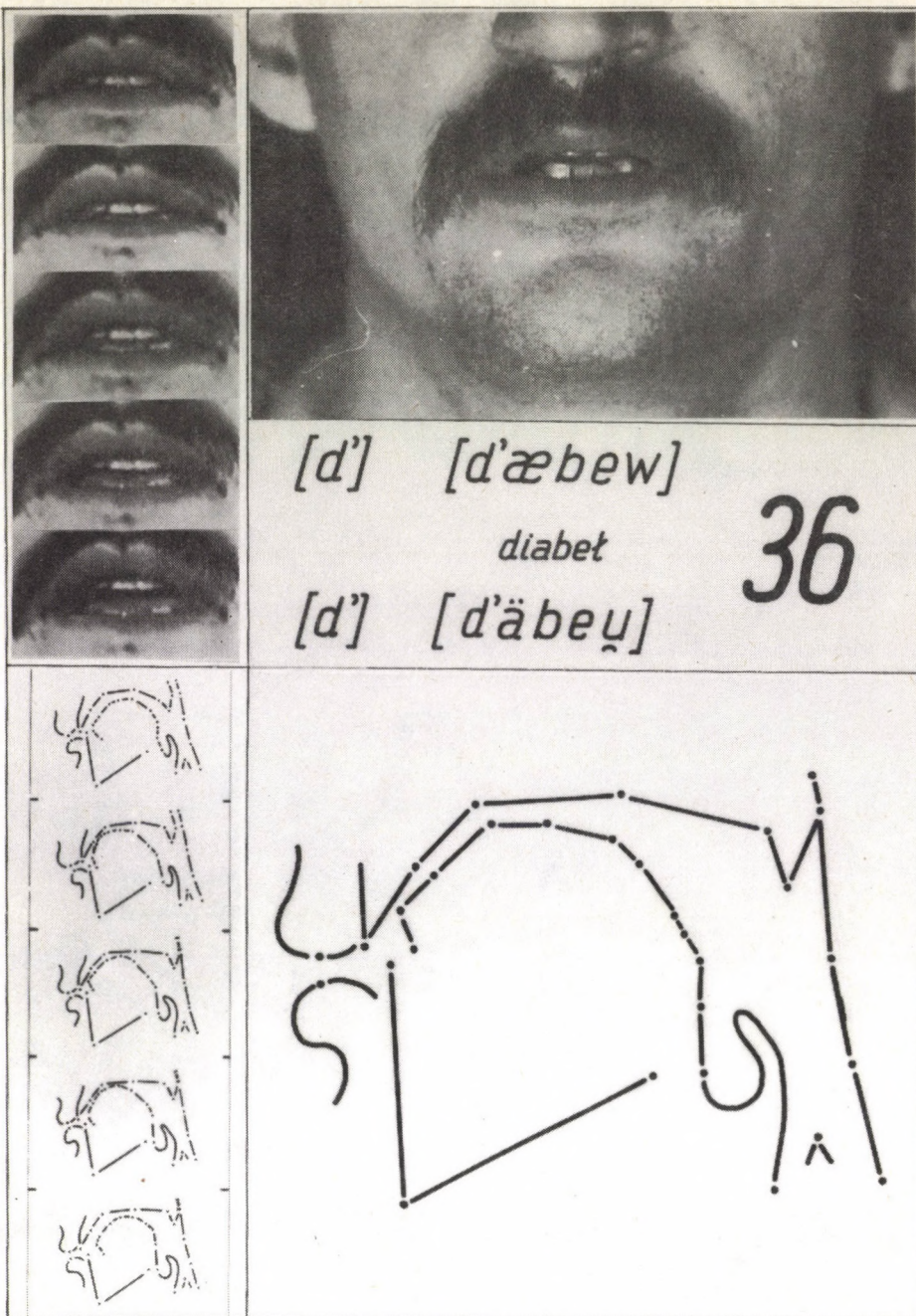
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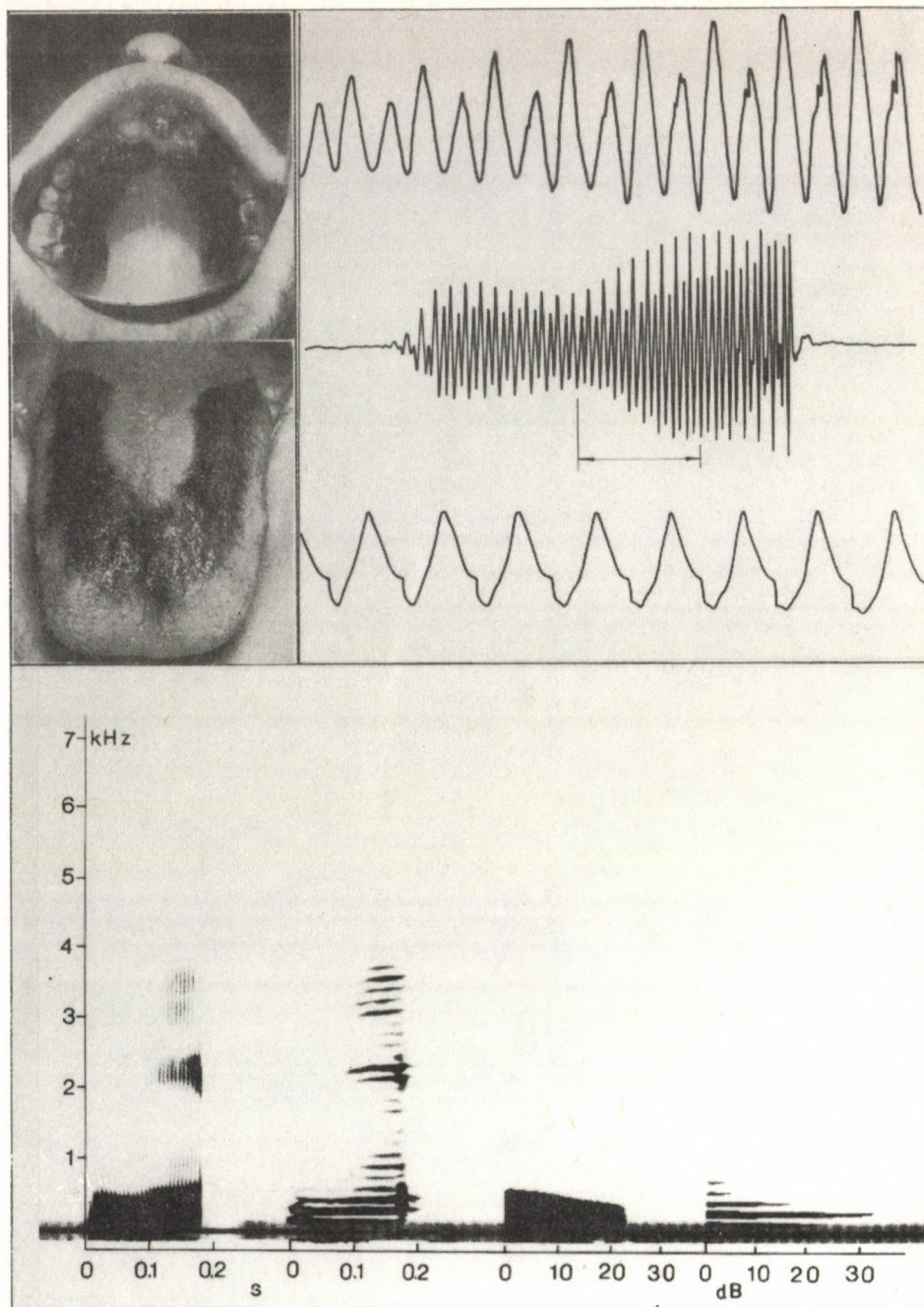
34

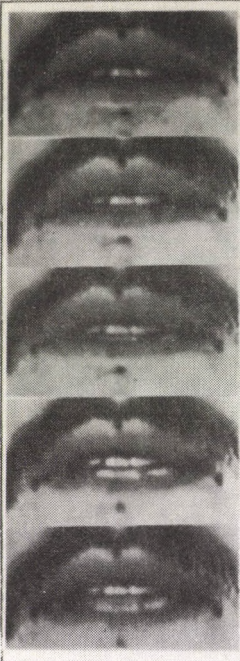

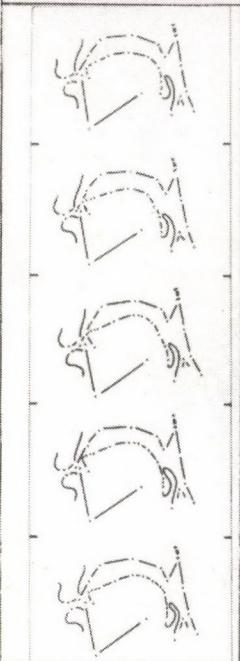
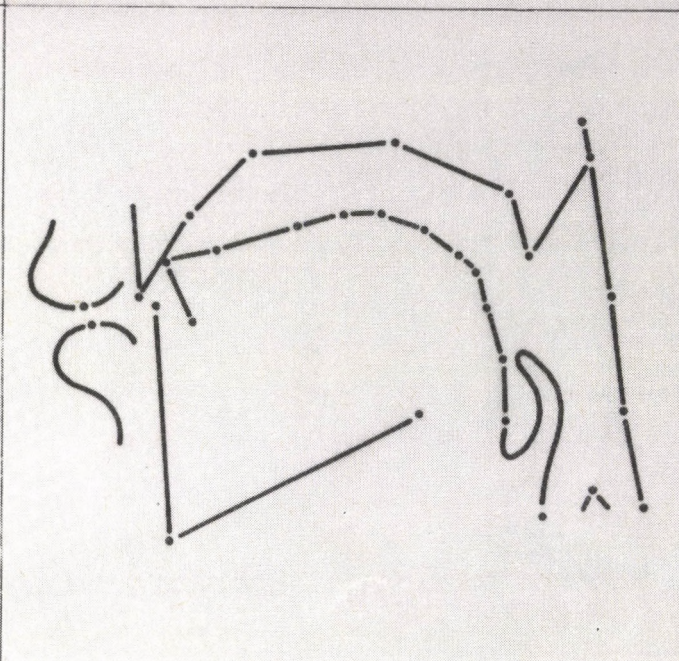


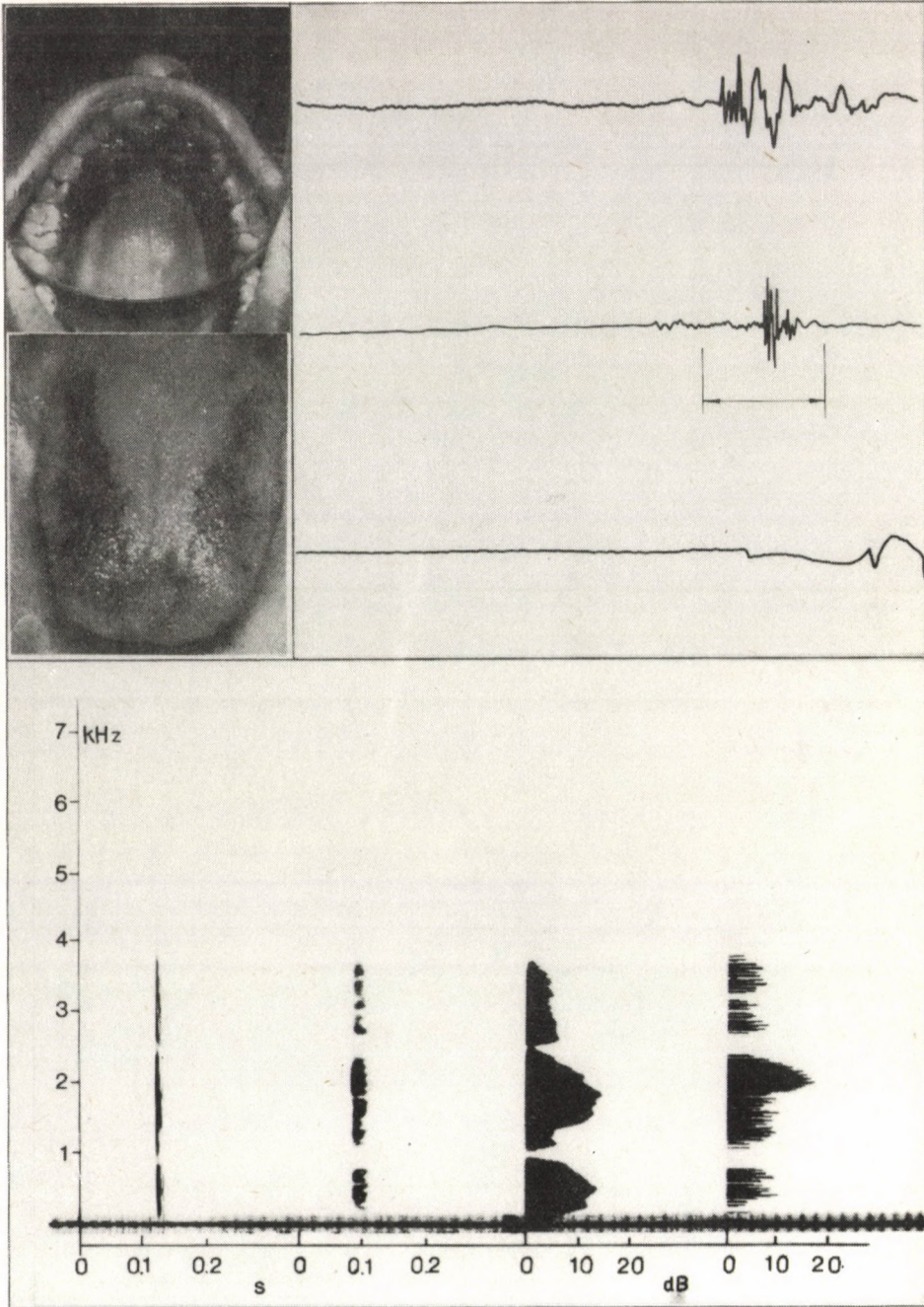
	
	<p>[dʰ] [dʰis]</p> <p><i>dis</i></p> <p>[dʰ] [dʰis]</p> <p style="text-align: right; font-size: 2em;">35</p>
	



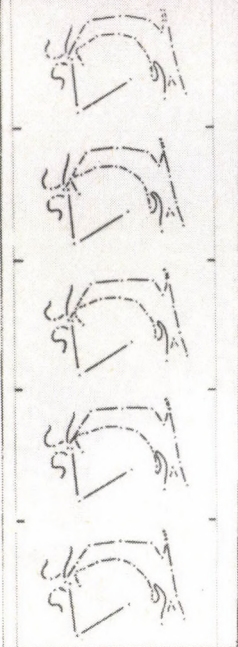
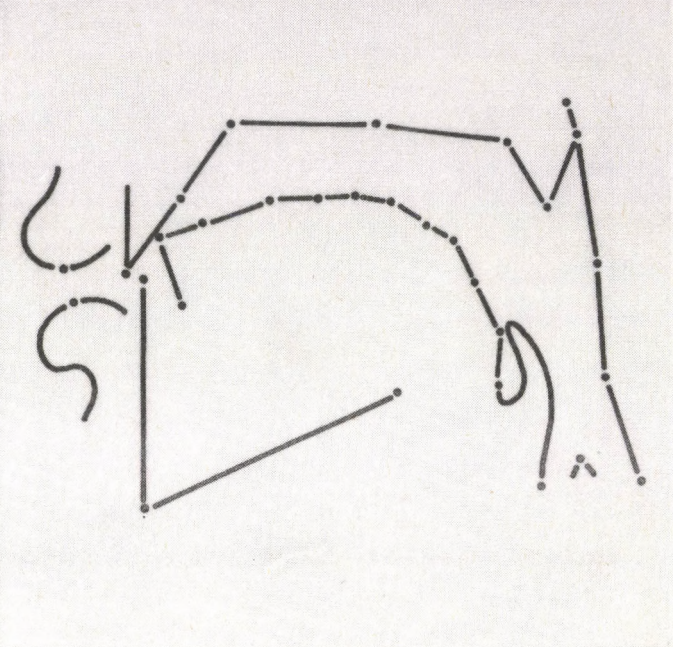


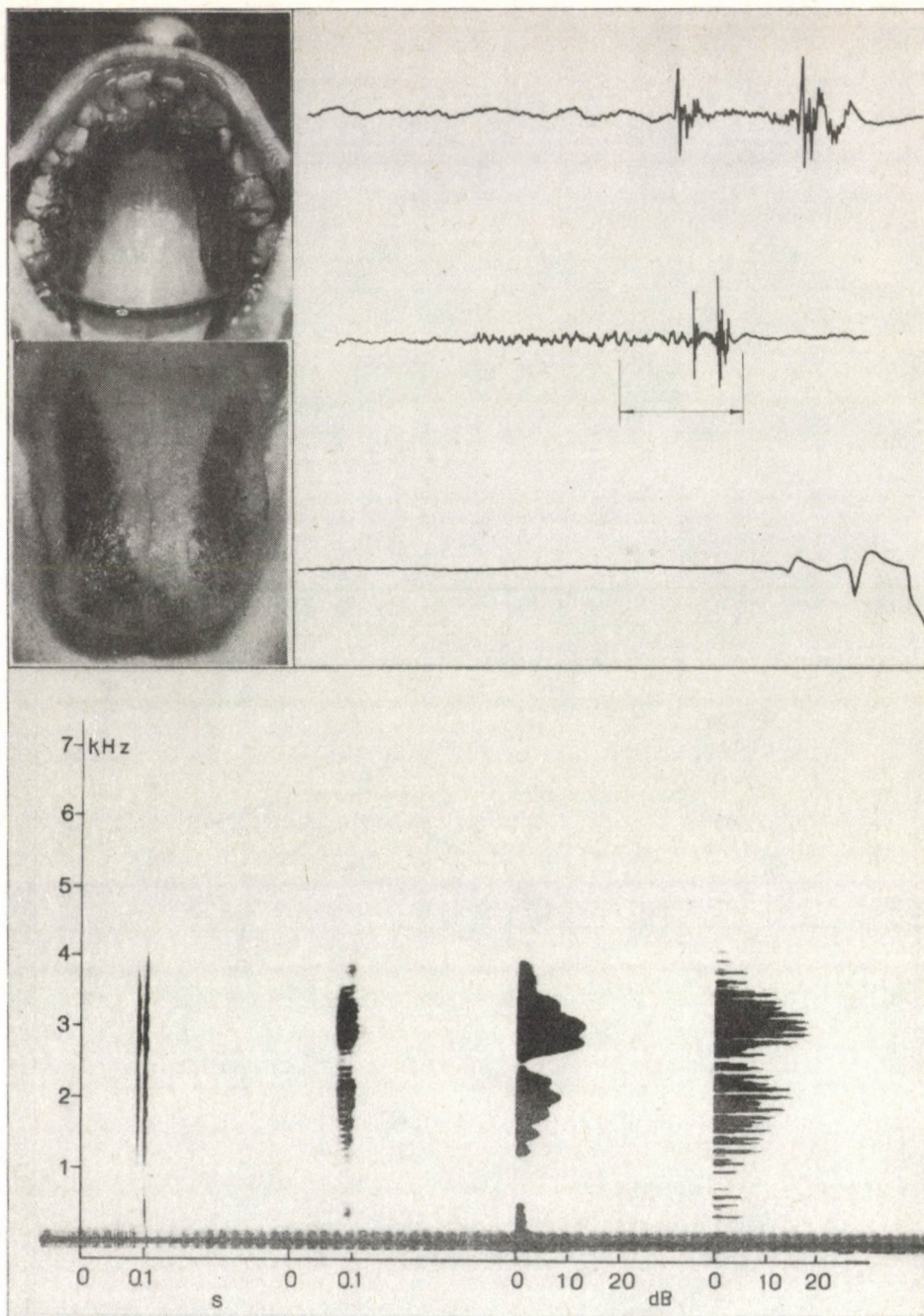


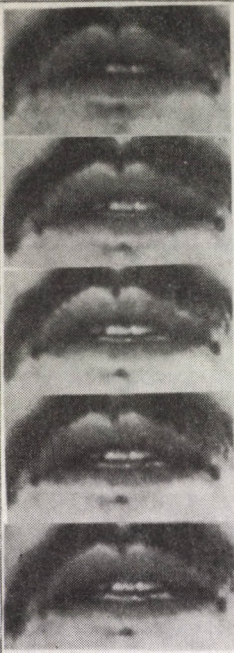
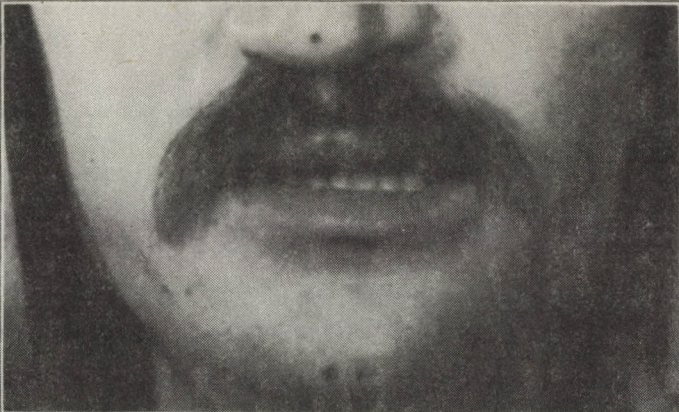
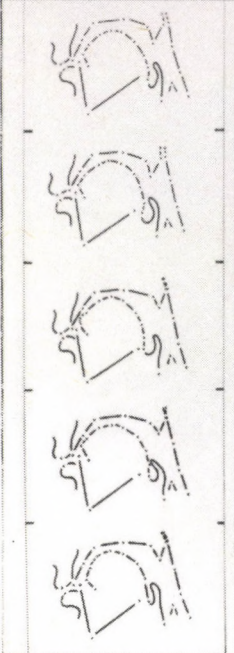
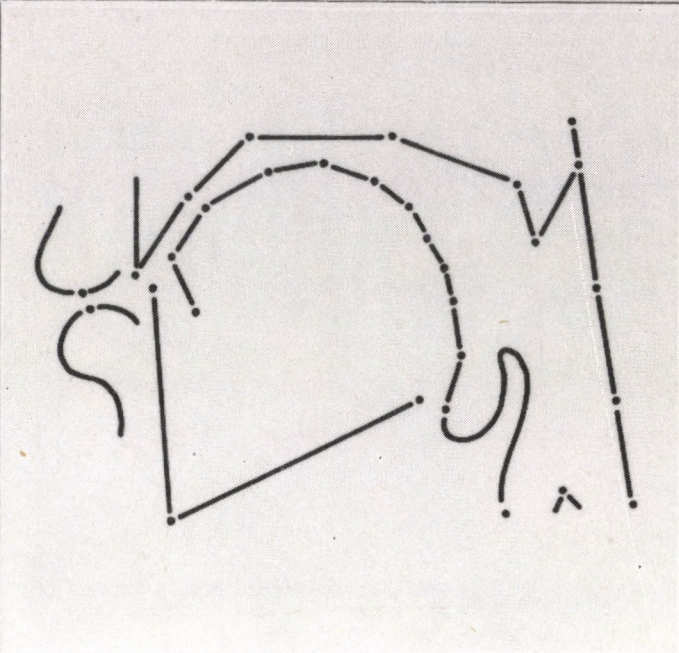


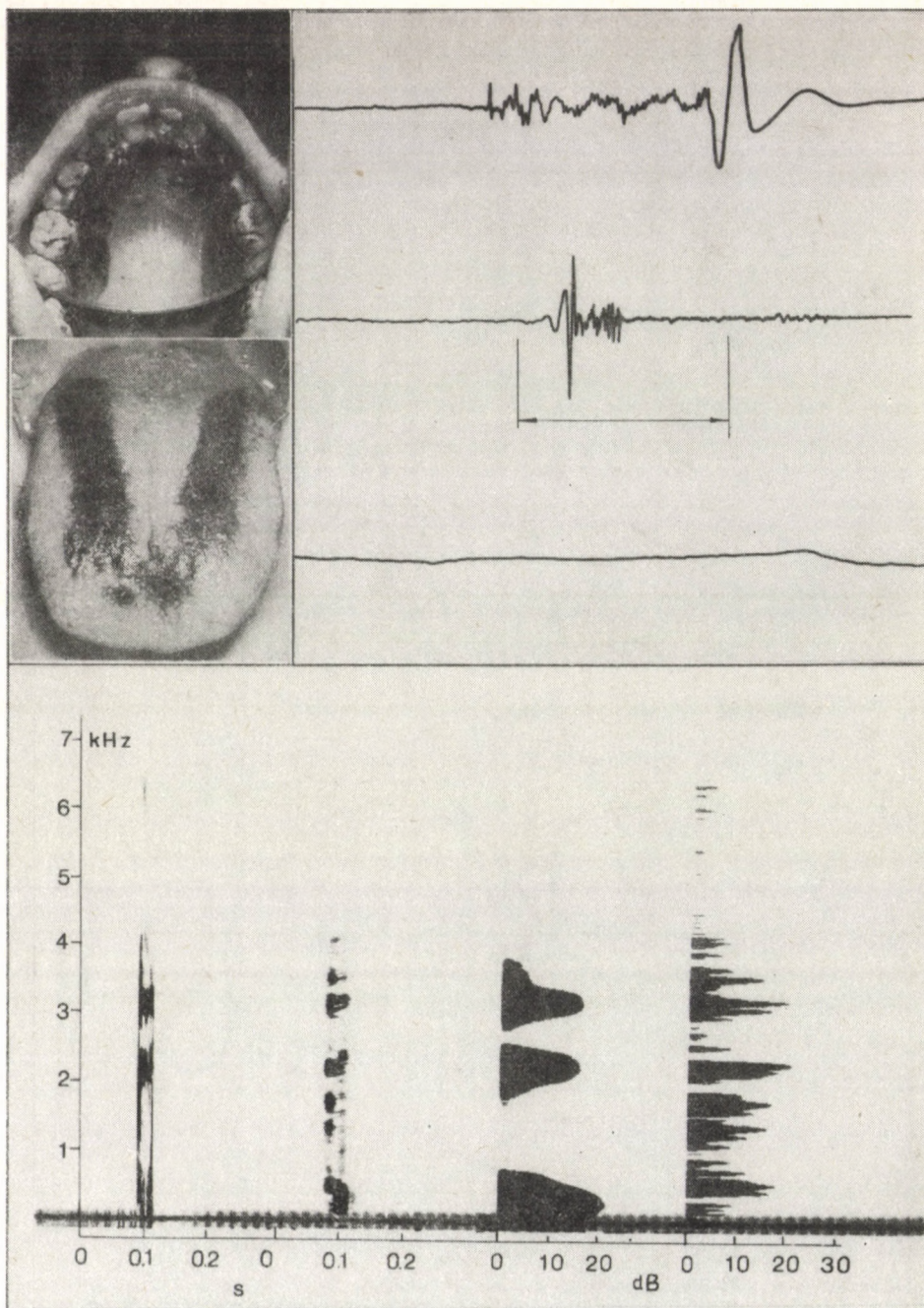
	
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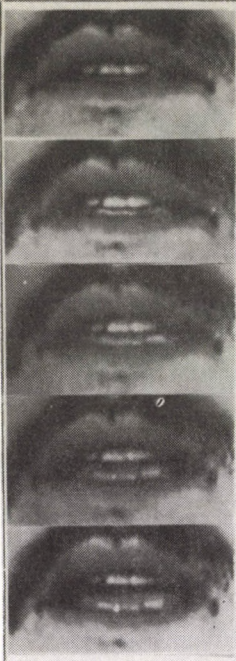
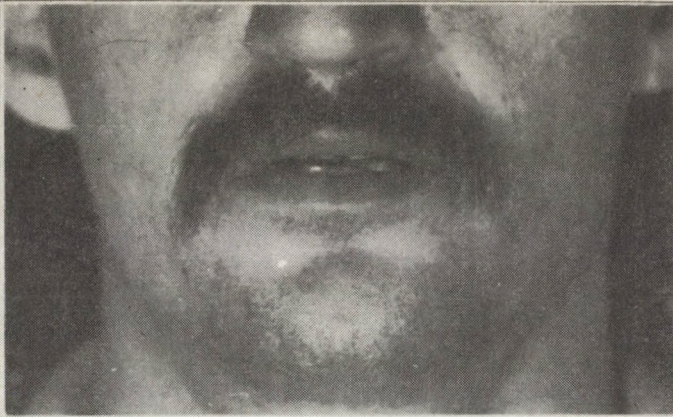
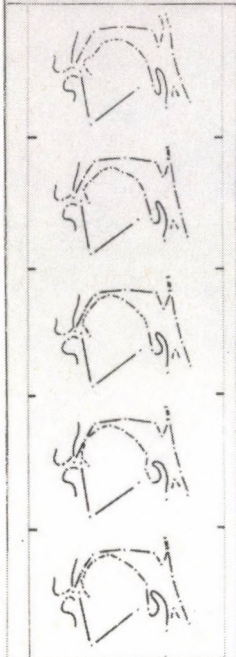
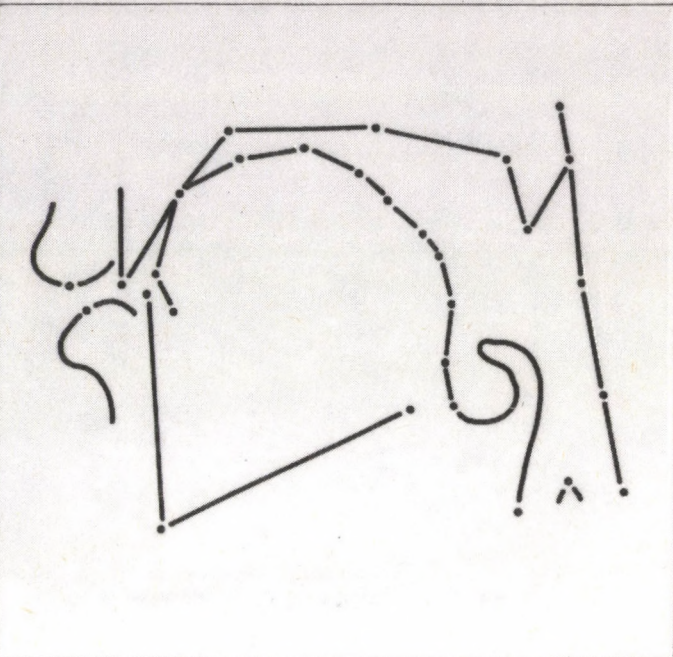


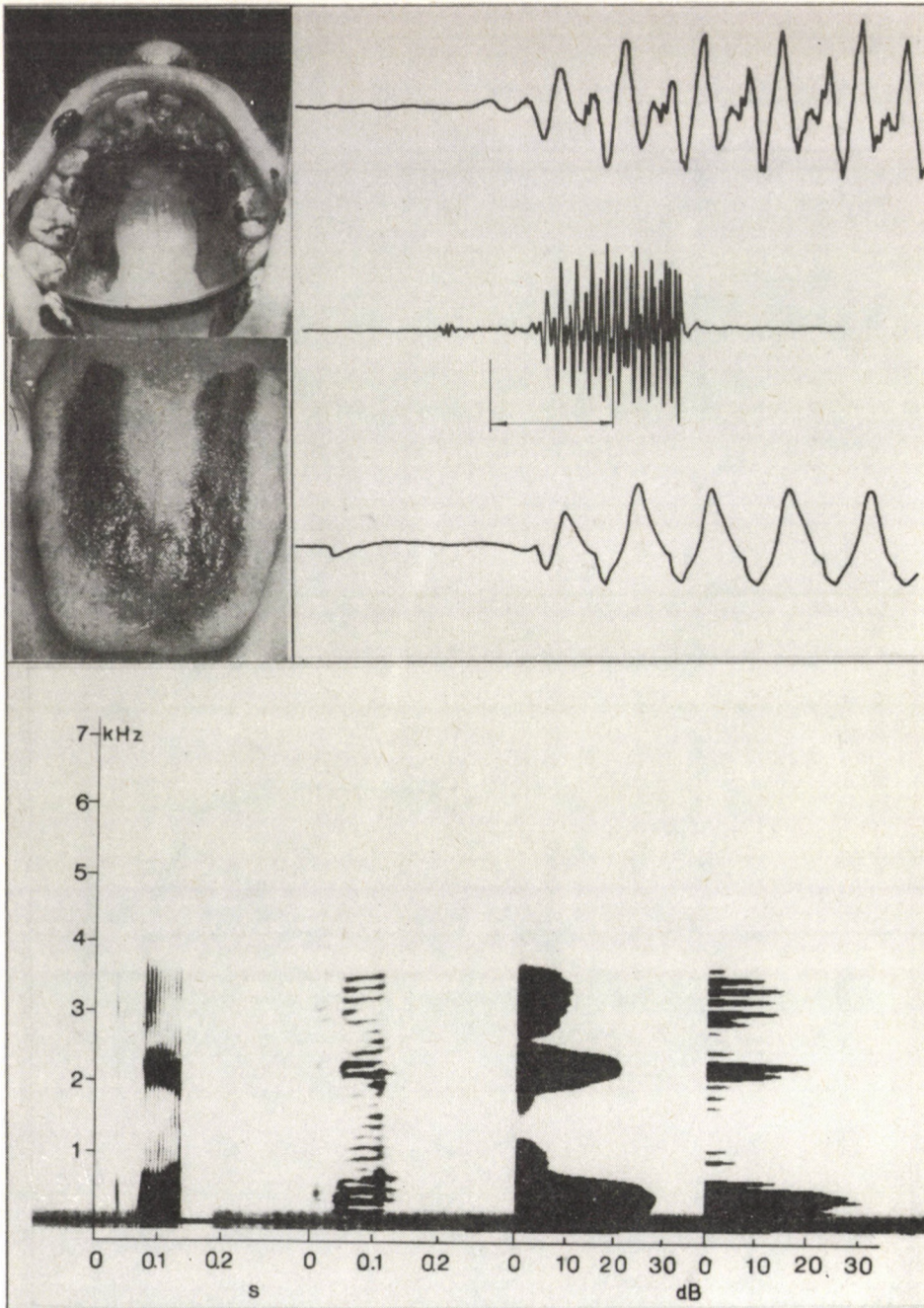
	
	<p> $[t]$ $[tʃeba]$ <i>trzeba</i> $[t]$ $[tʂeba]$ </p> <p style="text-align: right; font-size: 2em;">38</p>
	

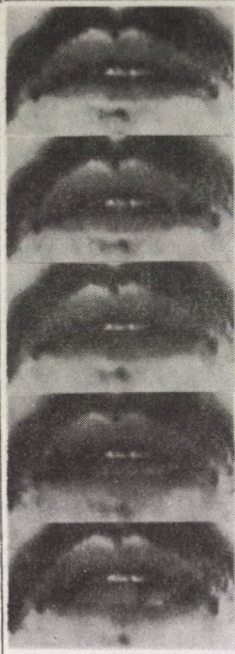

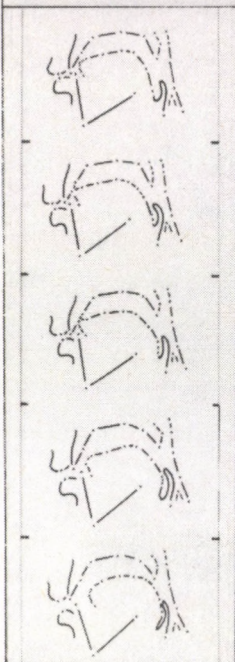
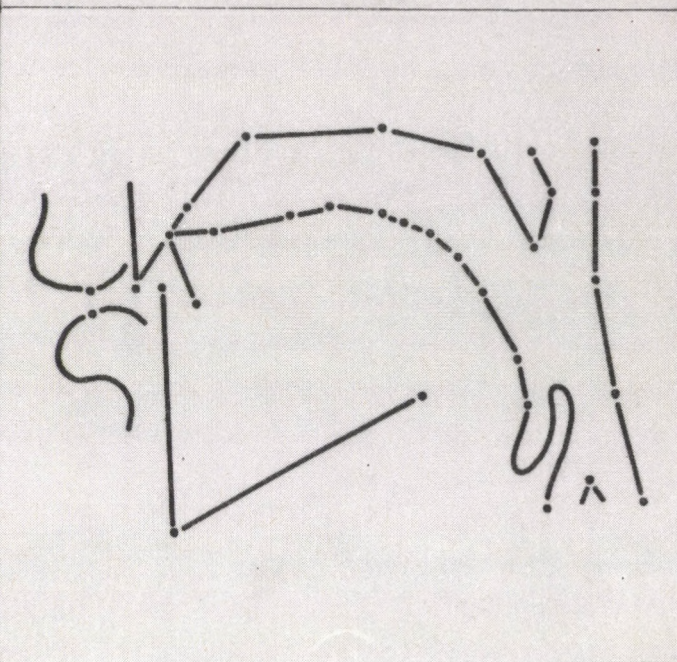


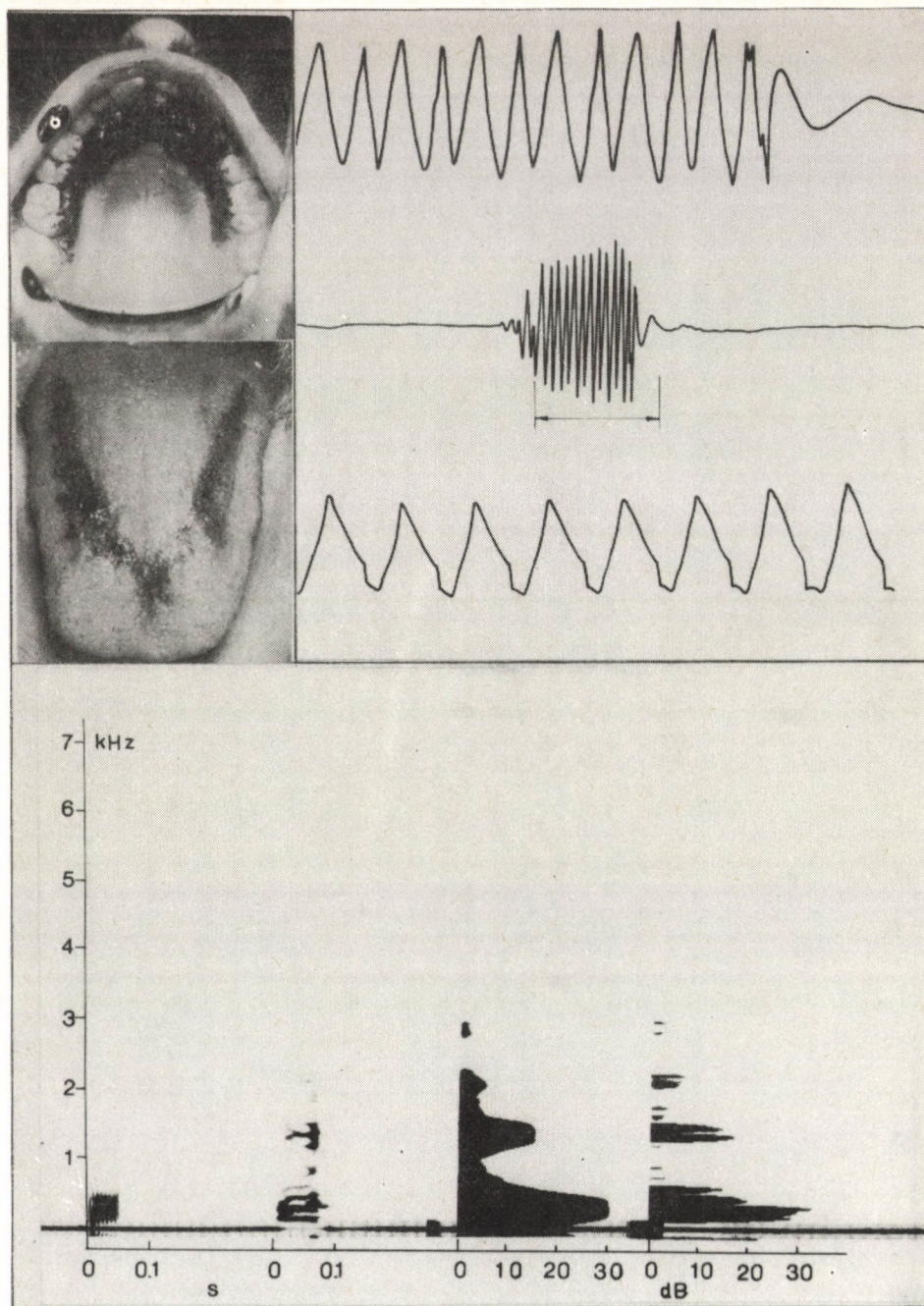
									
	<table> <tr> <td>[t']</td> <td>[t'ik]</td> <td rowspan="2">39</td> </tr> <tr> <td></td> <td>tik</td> </tr> <tr> <td>[t']</td> <td>[t'ik]</td> <td></td> </tr> </table>	[t']	[t'ik]	39		tik	[t']	[t'ik]	
[t']	[t'ik]	39							
	tik								
[t']	[t'ik]								
									

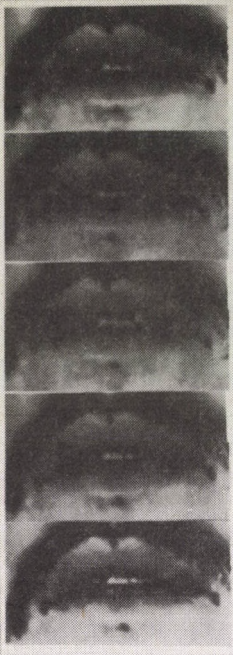
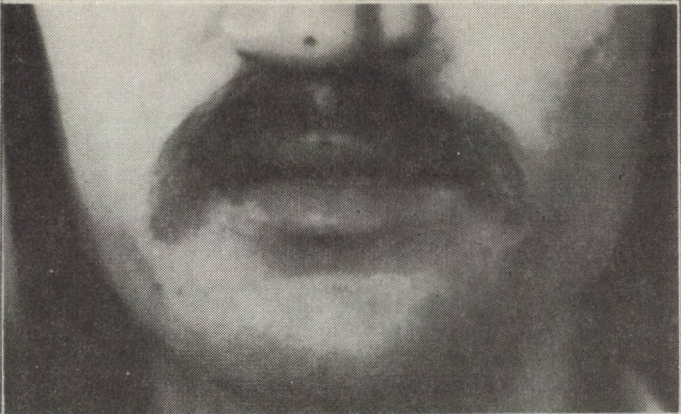
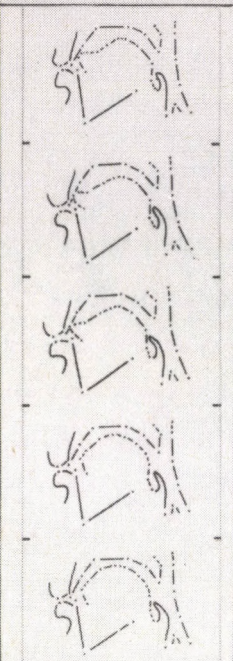
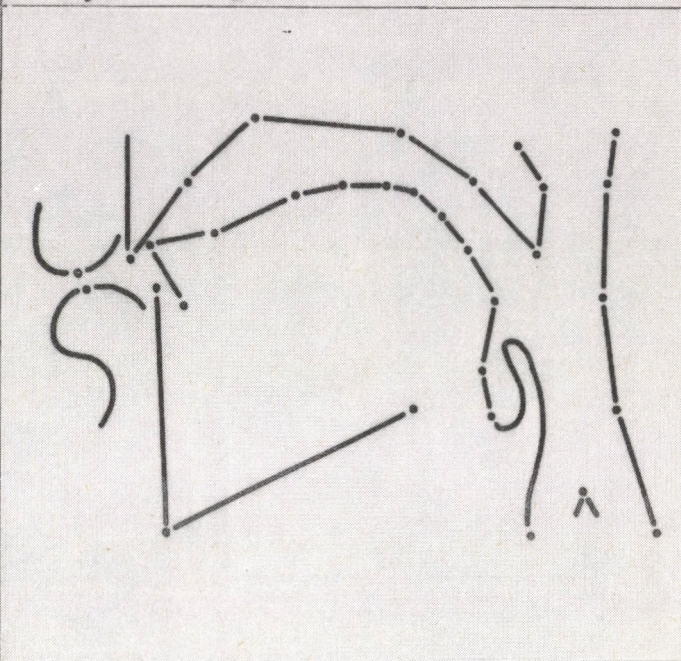


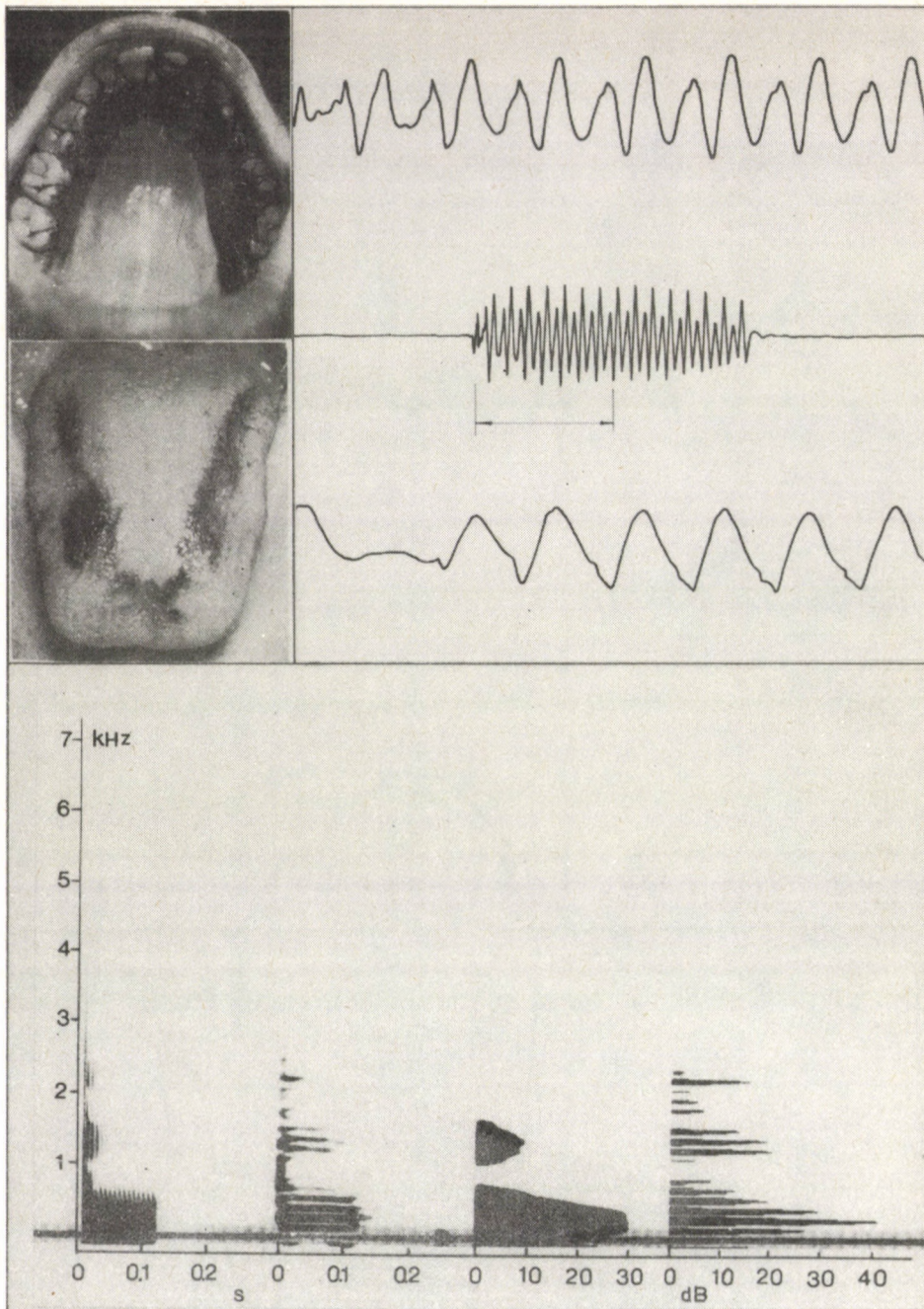
	
	<p> <i>[t']</i> <i>[t'æra]</i> <i>tiara</i> <i>[t']</i> <i>[t'ära]</i> </p> <p style="text-align: right; font-size: 2em;">40</p>
	

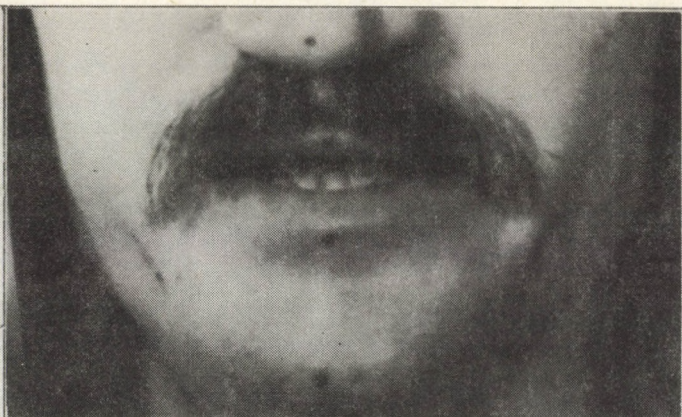
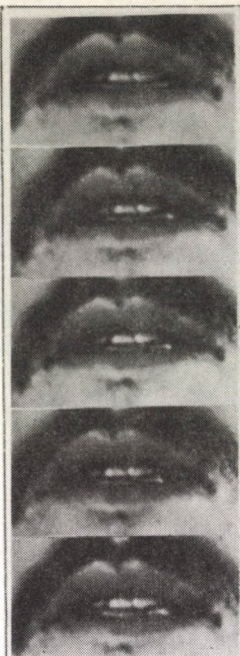


	
	<p>[n] [napuj]</p> <p>napój</p> <p>[n] [napuj]</p> <p style="text-align: right; font-size: 2em;">41</p>
	



	
	<p>[ŋ] [garŋka] <i>garnka</i></p> <p>[ŋ] [garŋka]</p> <p style="font-size: 2em; float: right;">42</p>
	



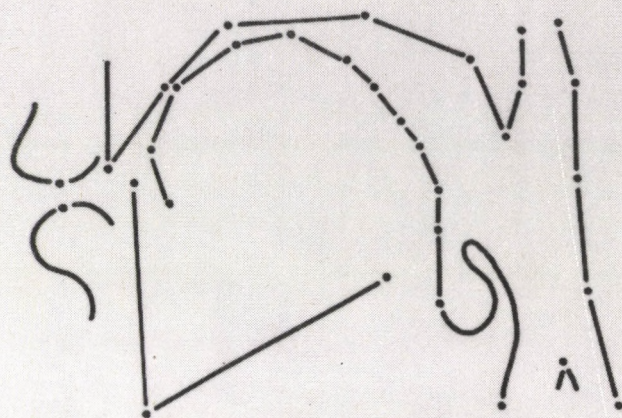
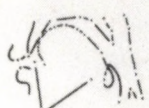
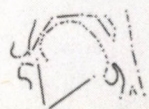


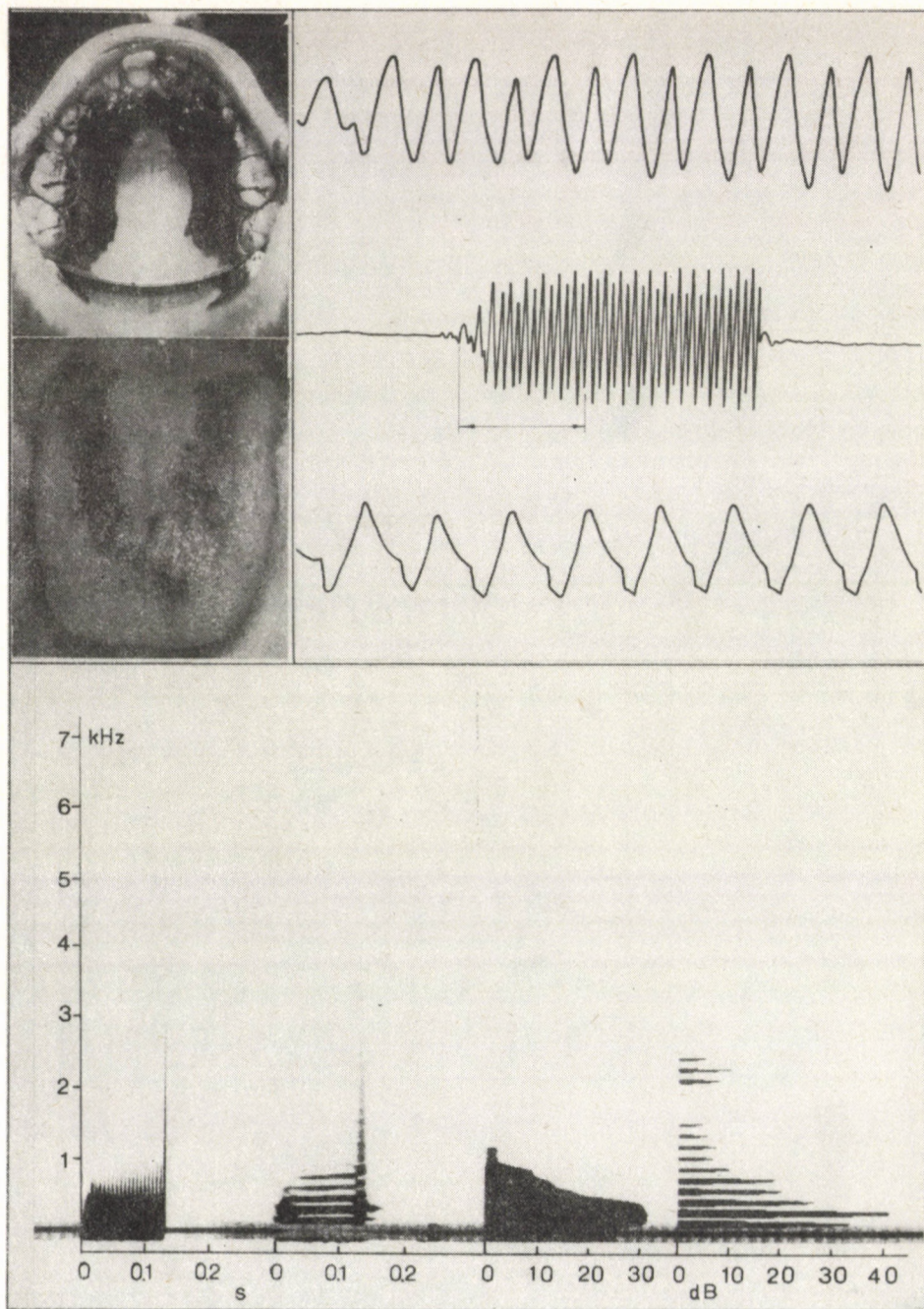
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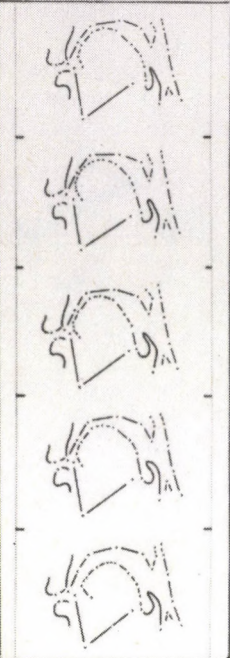
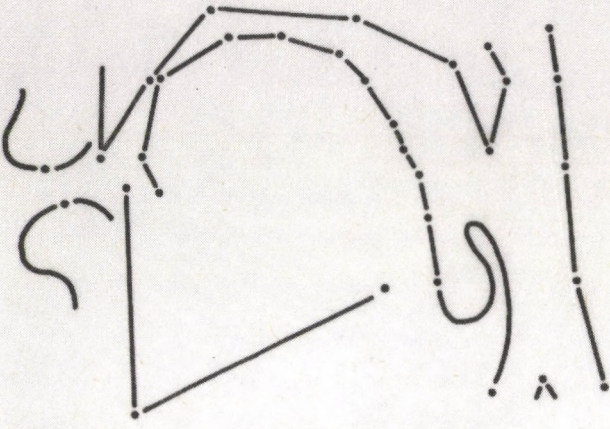
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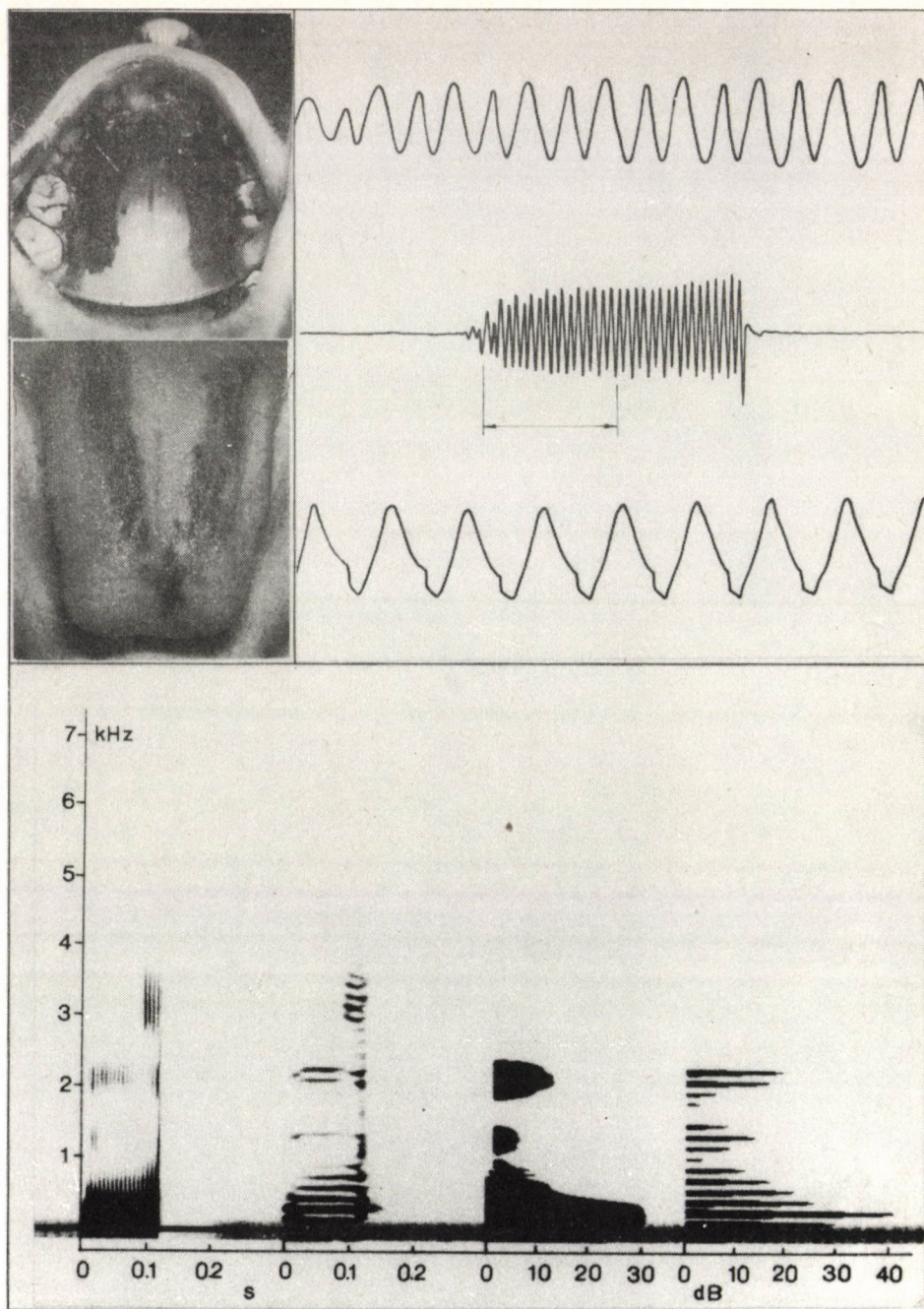
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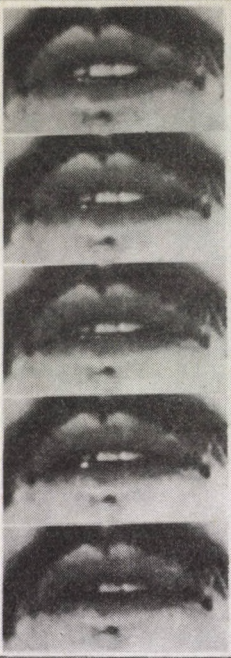
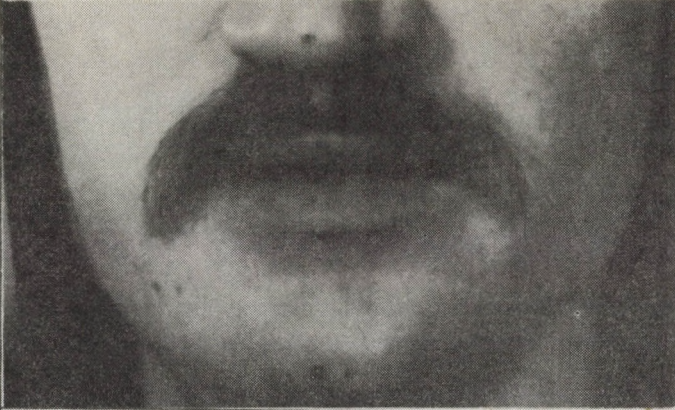
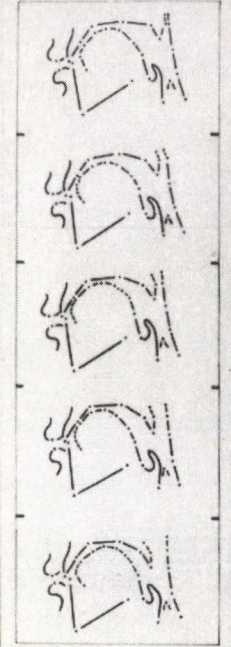
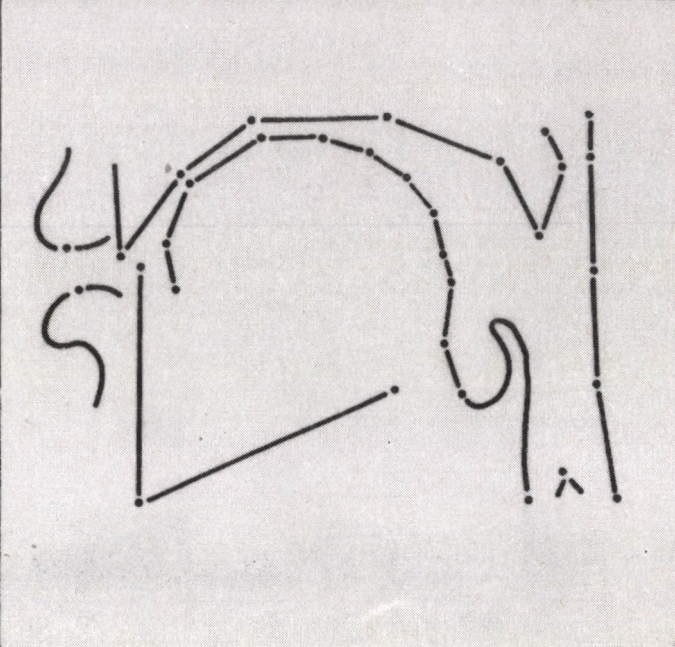
43

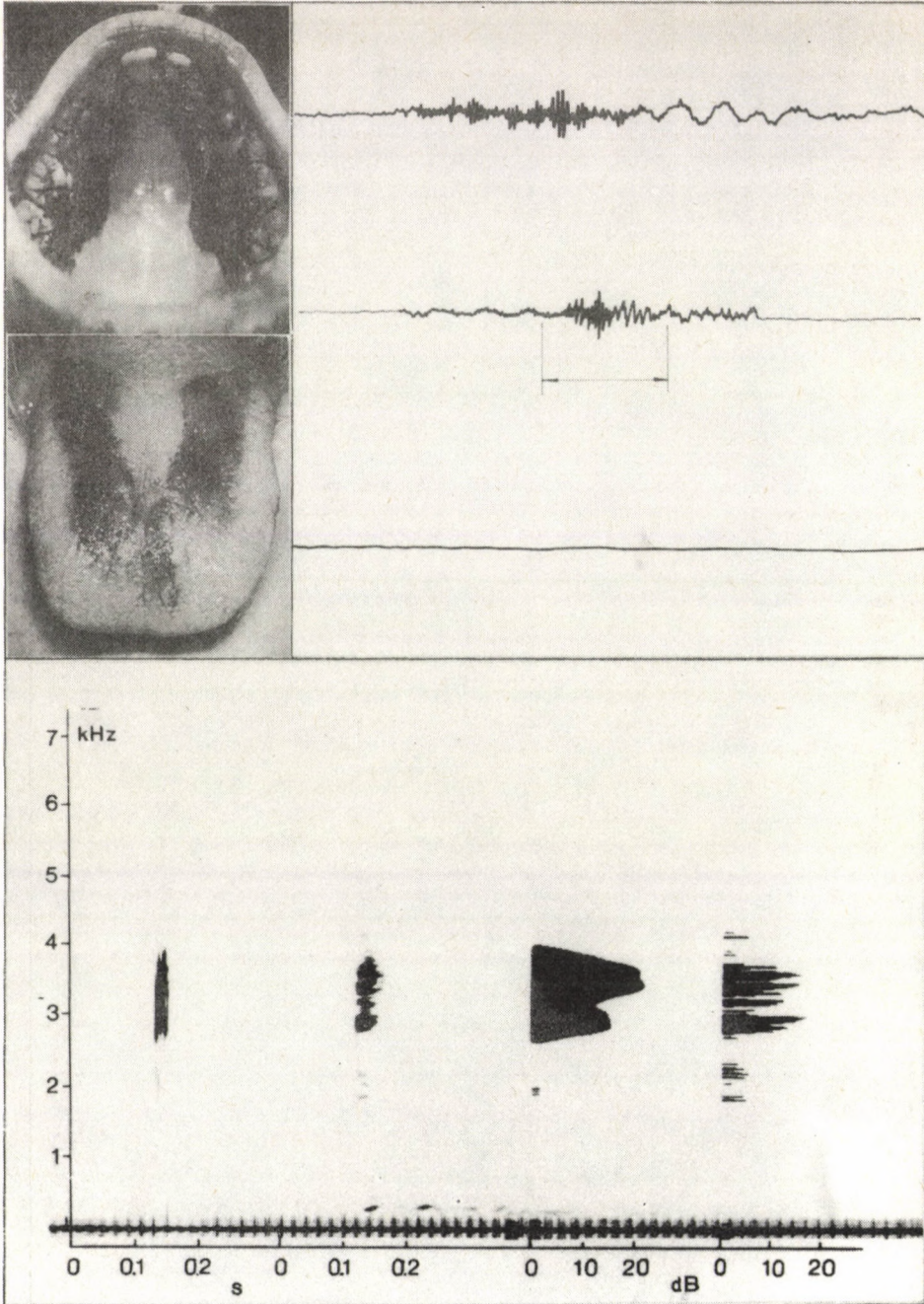


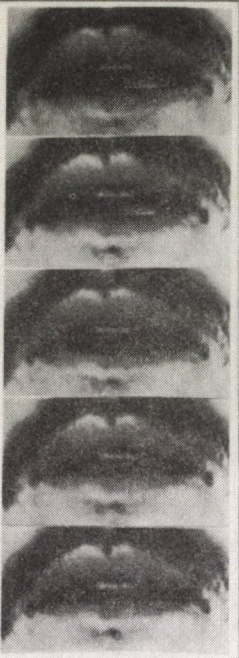
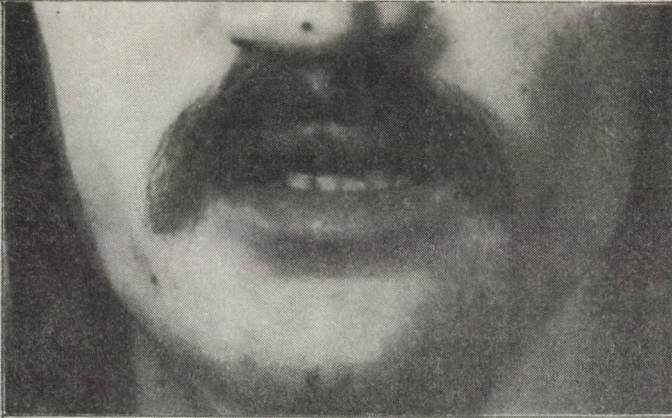
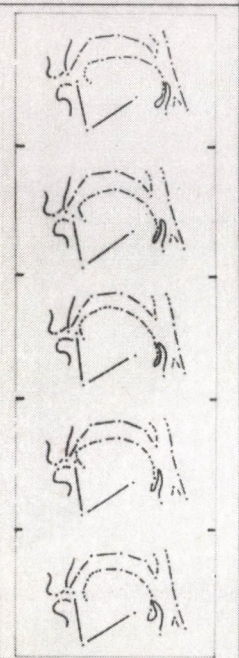
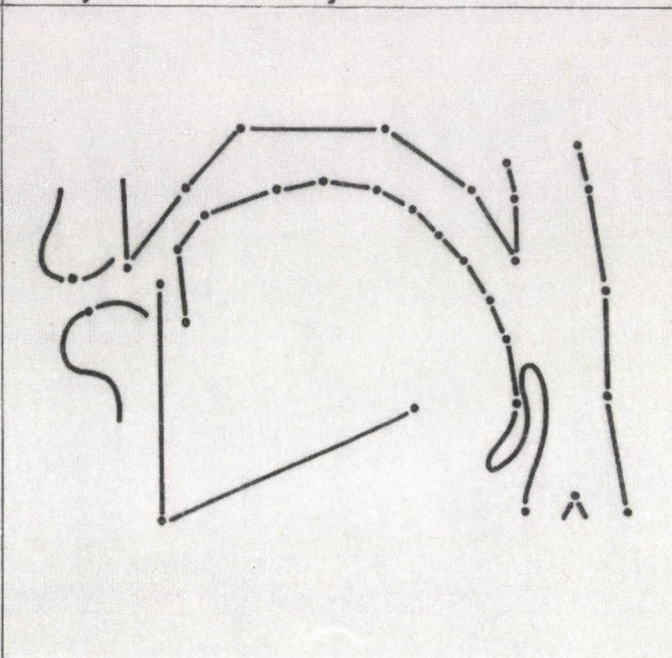


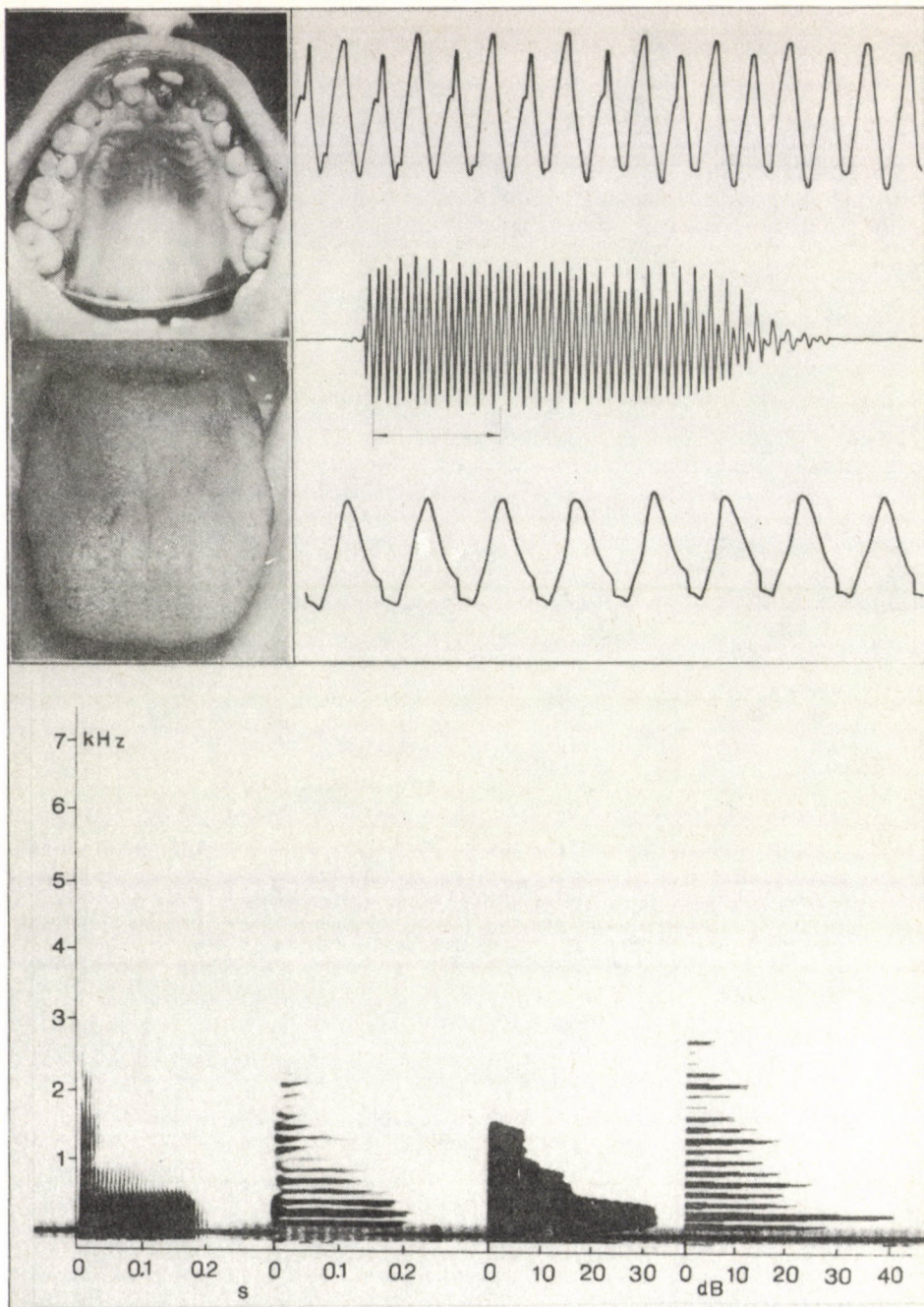
	
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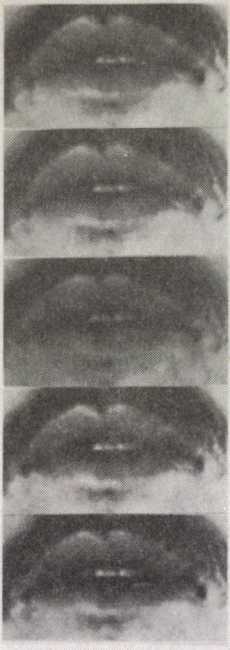
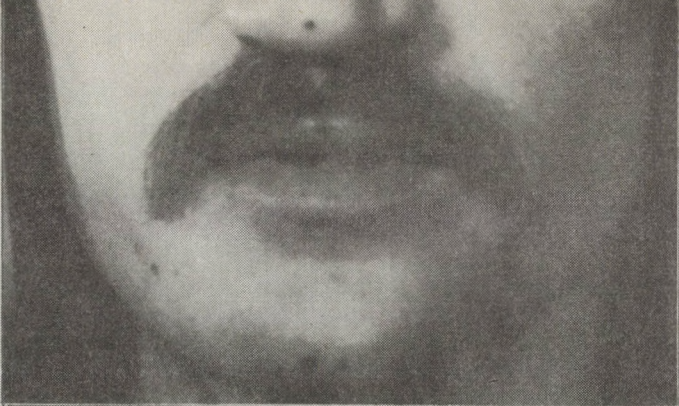
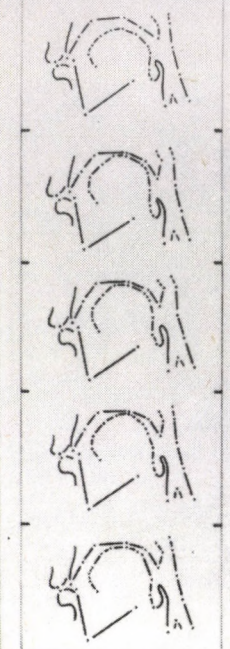
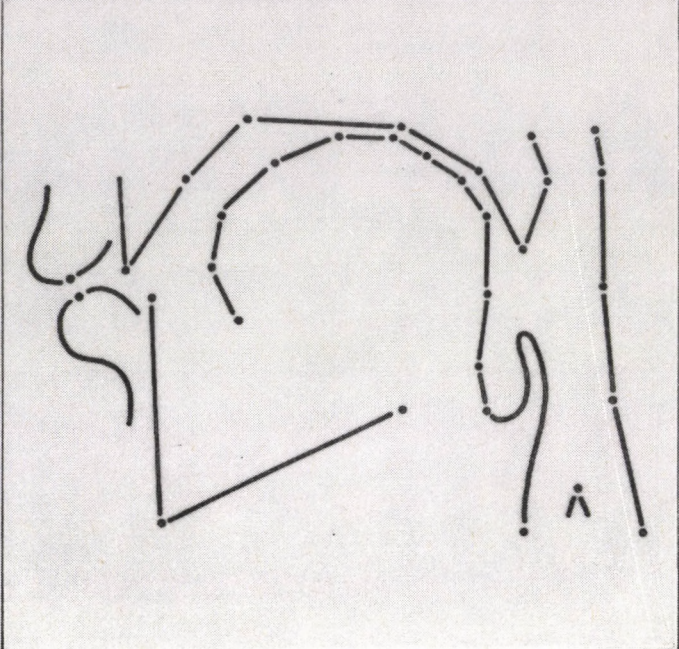


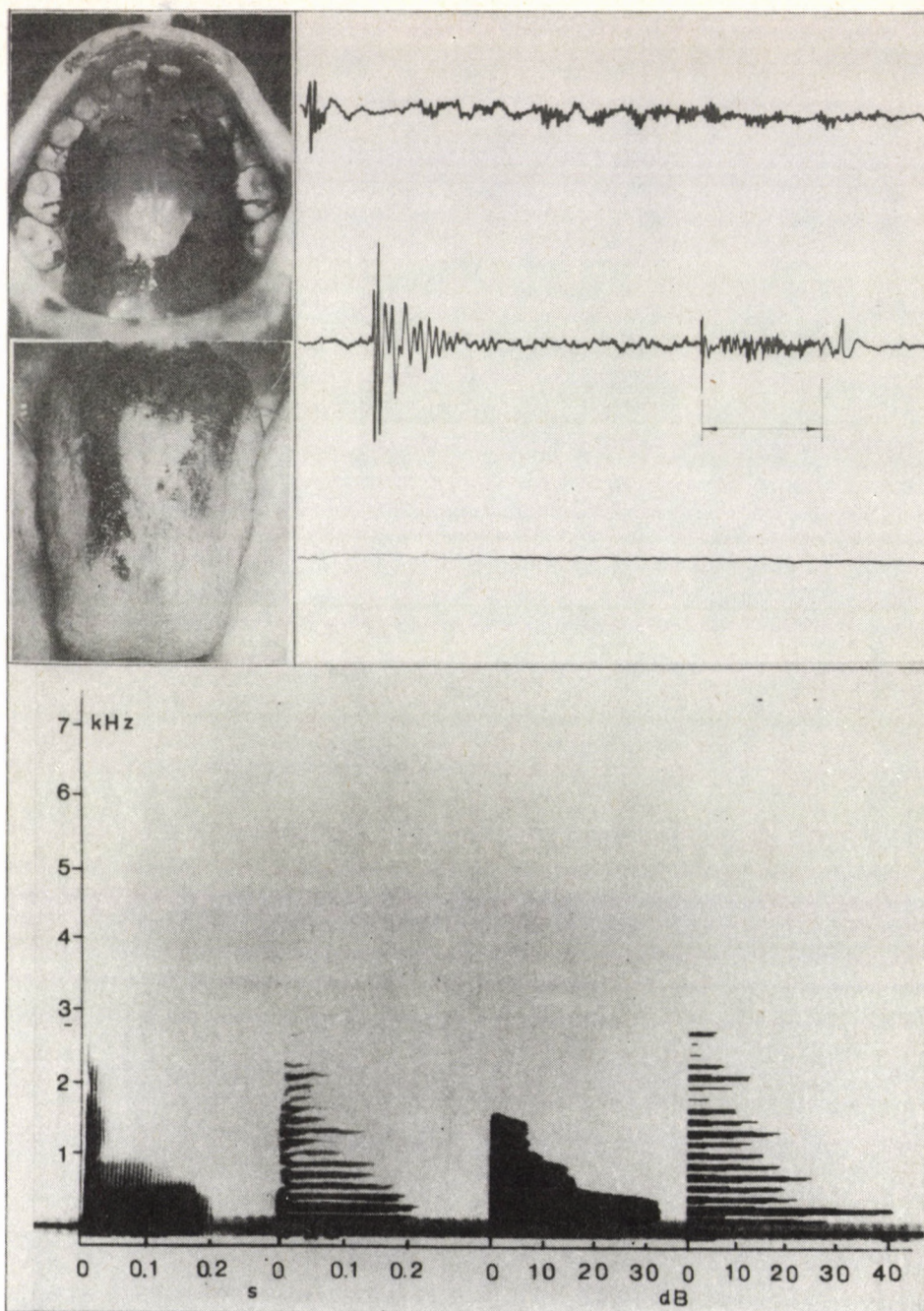
	
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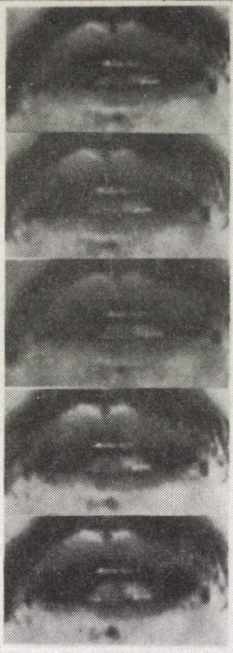

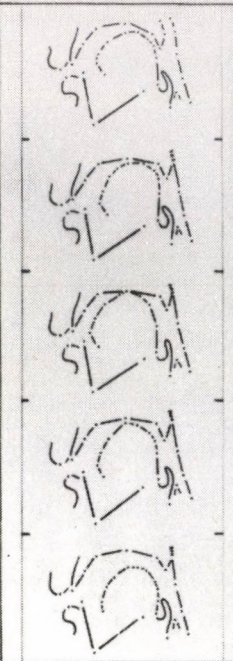
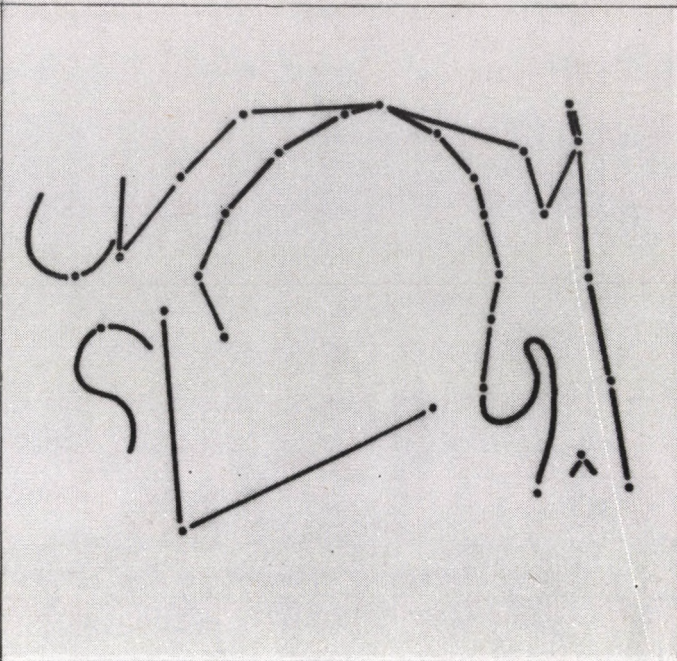


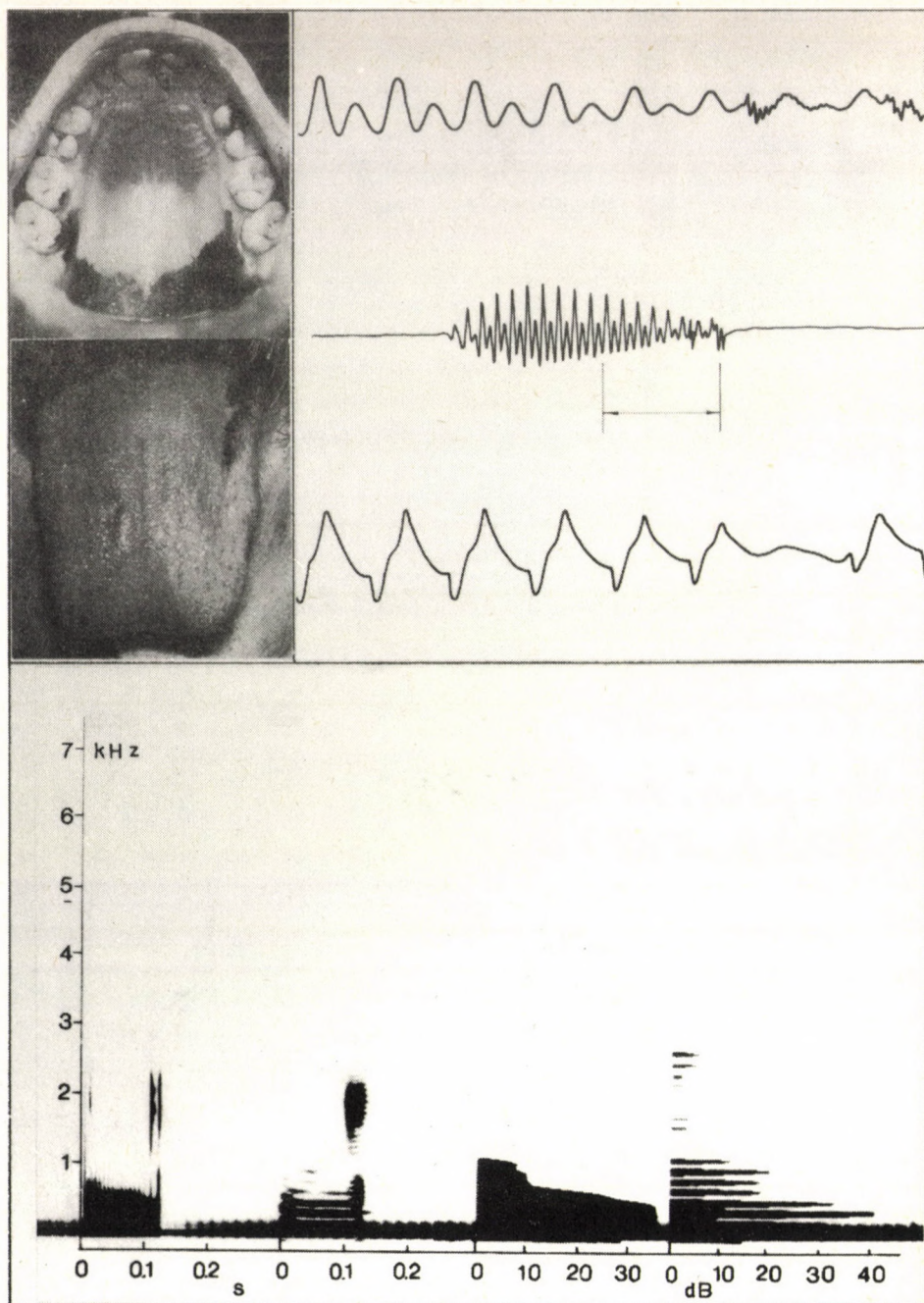
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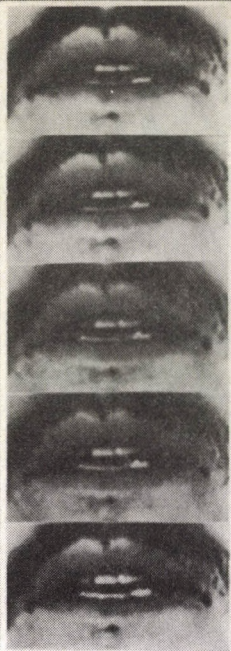
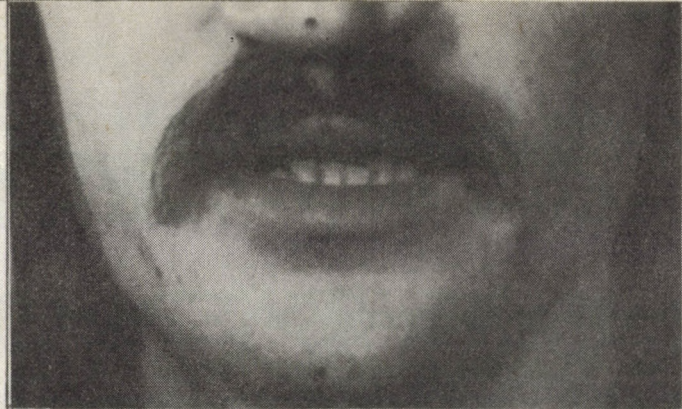
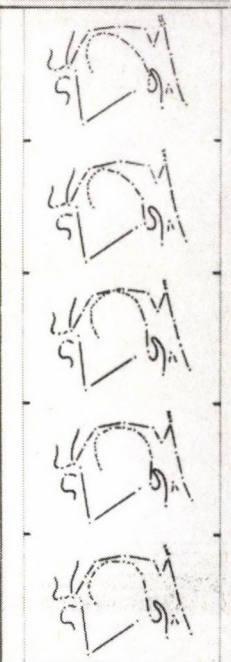
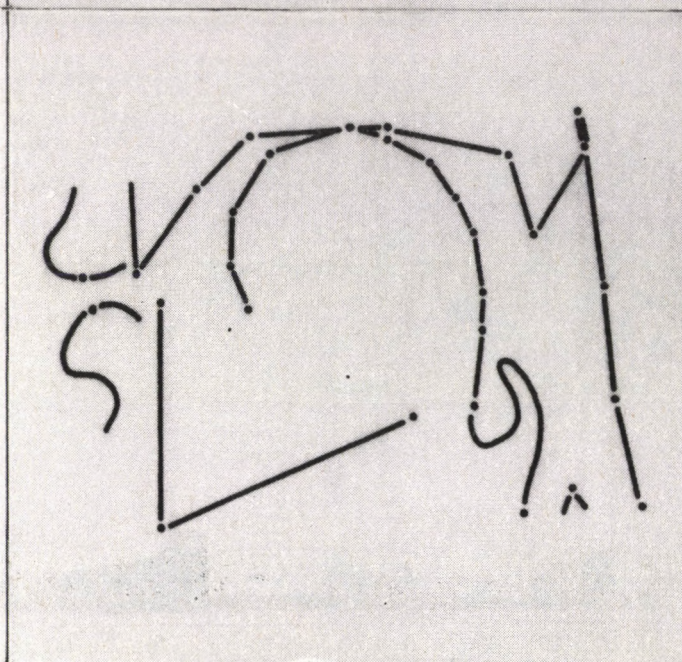


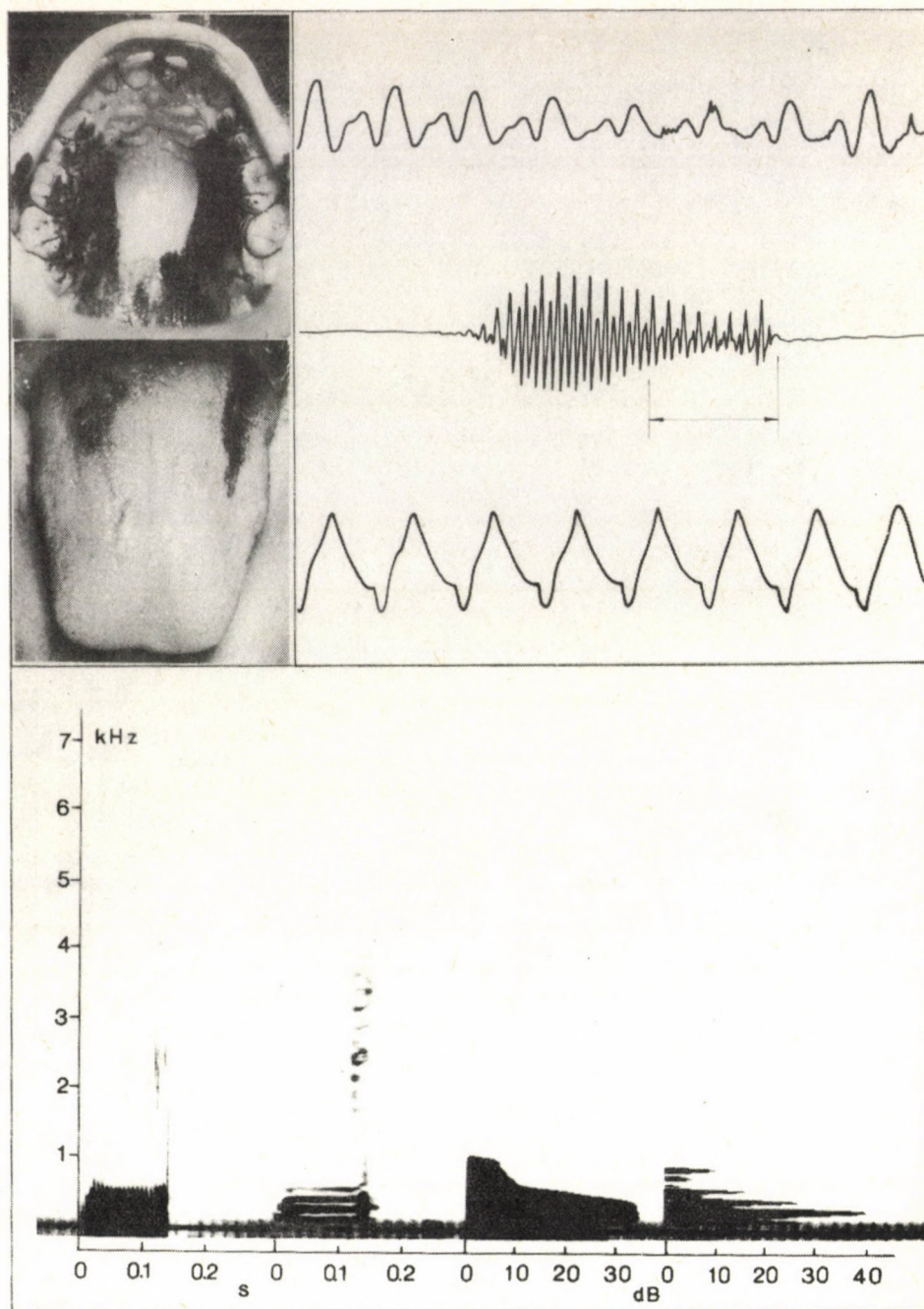
	 <p data-bbox="539 573 926 802"> <i>[ɤ]</i> <i>[rẽɤk'i]</i> <i>reki</i> <i>[ɤ]</i> <i>[rɛɤk'i]</i> </p> <p data-bbox="1001 626 1127 749" style="font-size: 2em;">47</p>
	

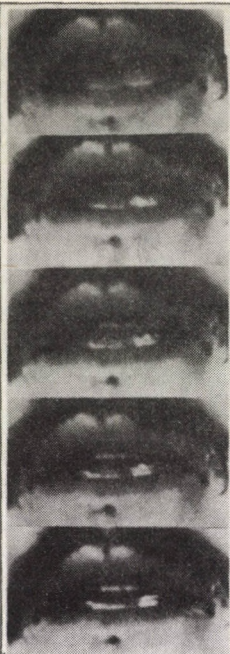
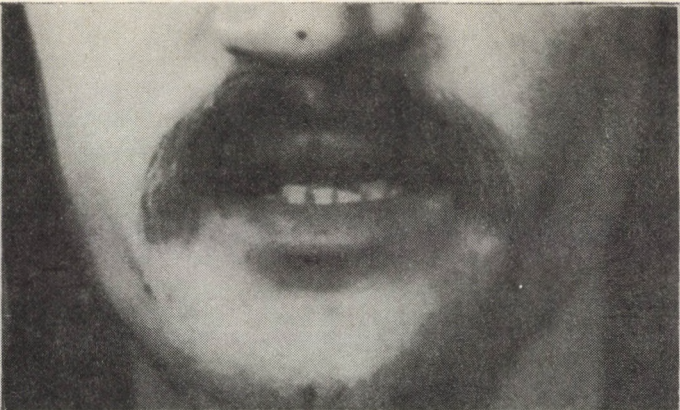
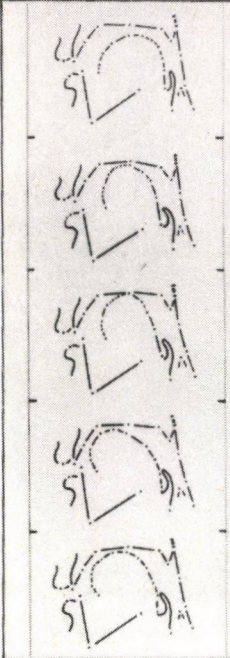
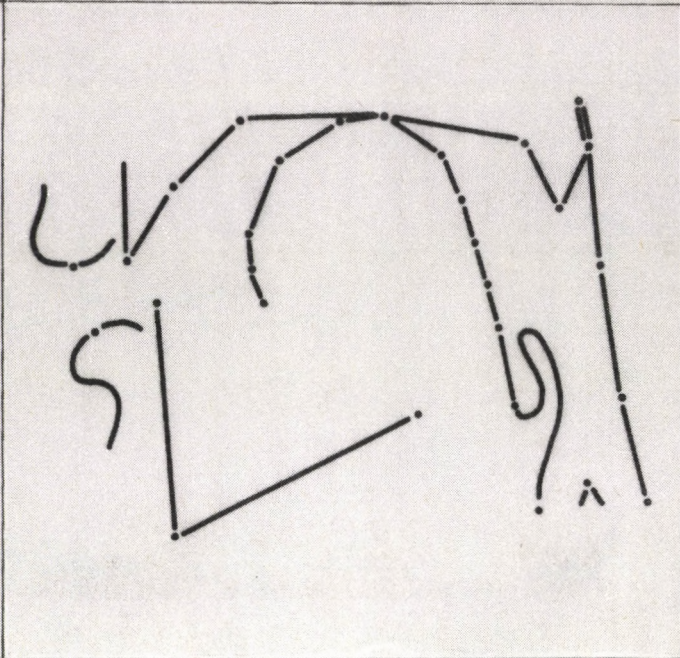


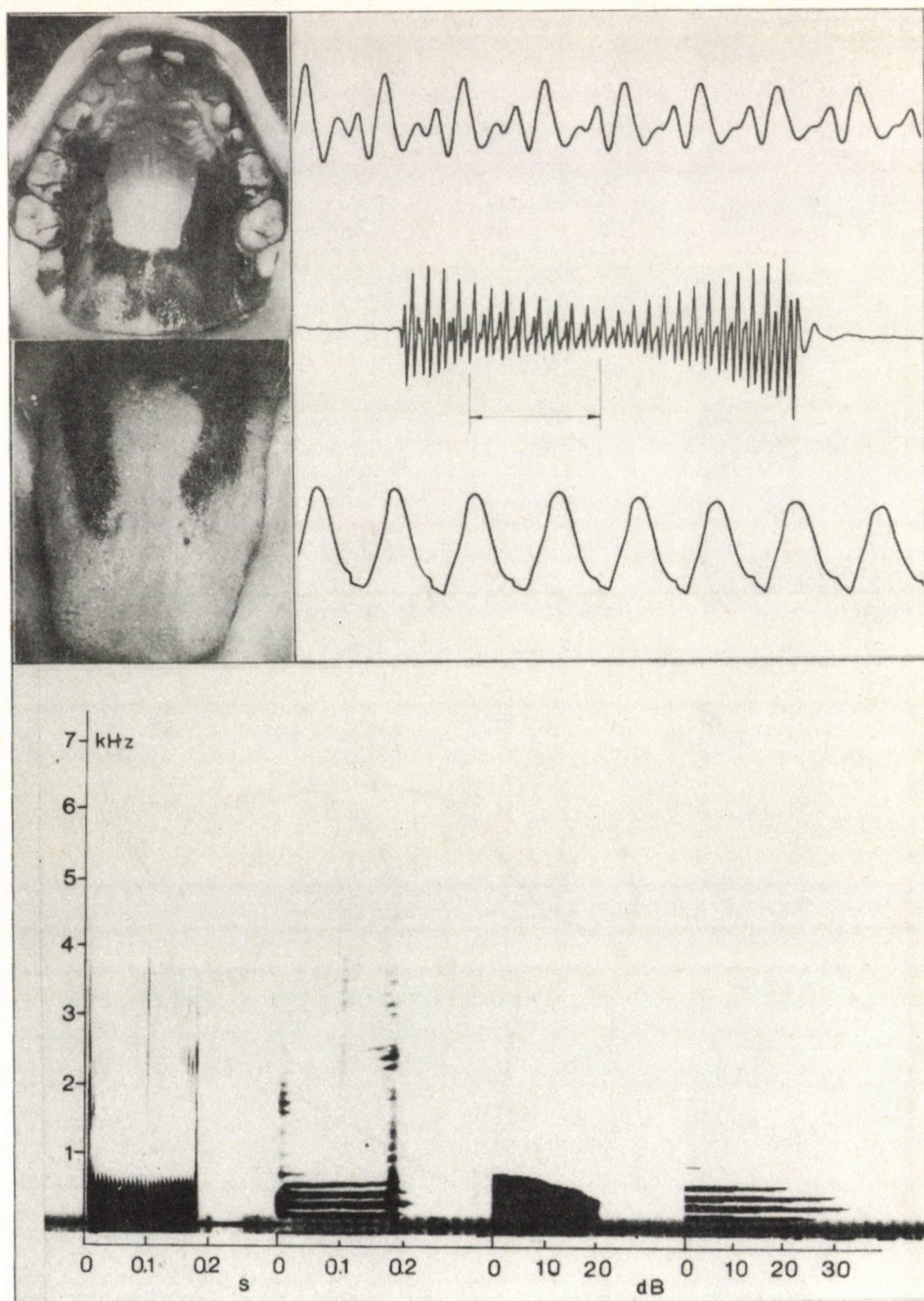
	
	<p>[g] [g a d a]</p> <p>gada</p> <p>[g] [g a d a]</p> <p style="font-size: 2em; font-weight: bold;">48</p>
	

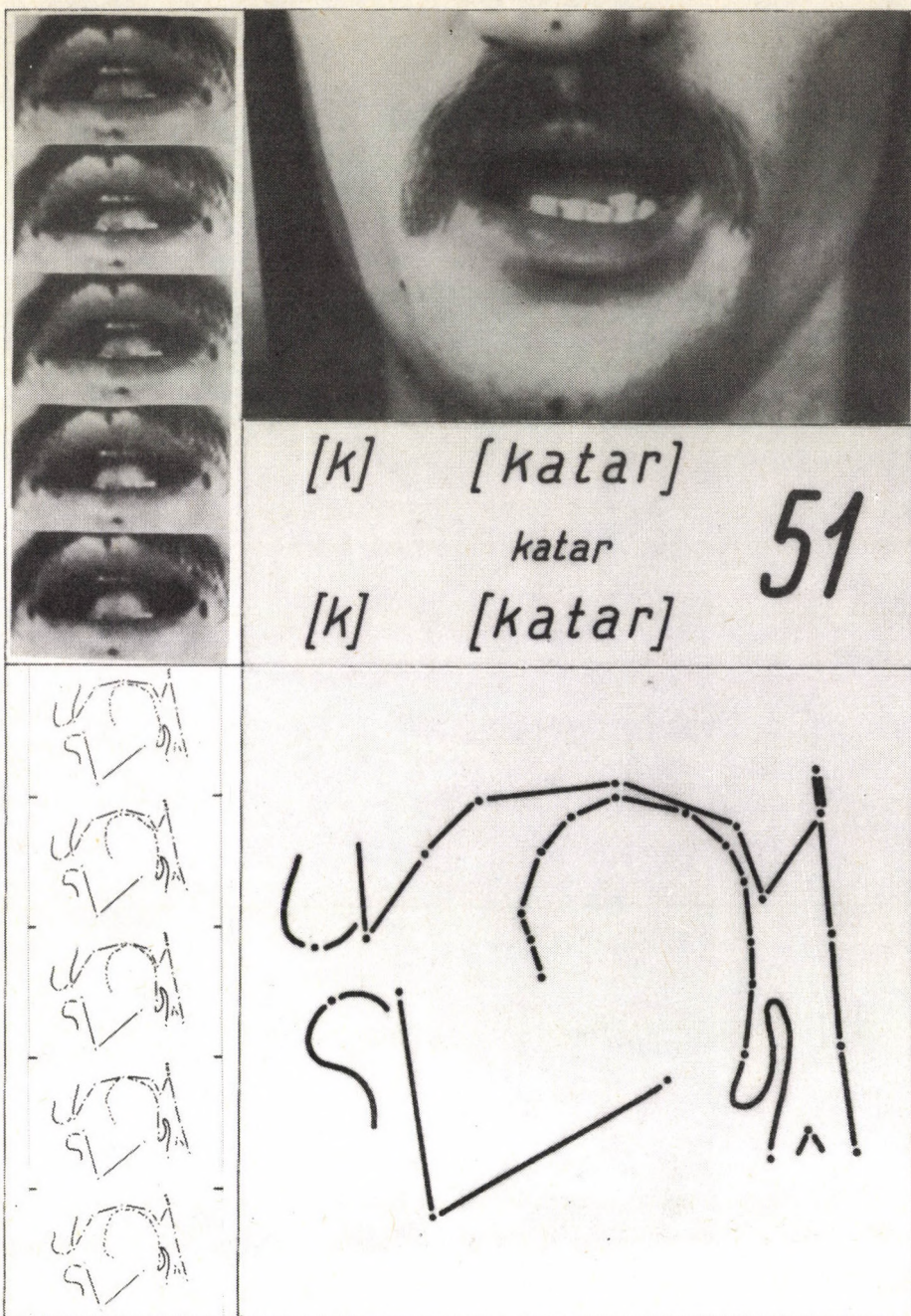


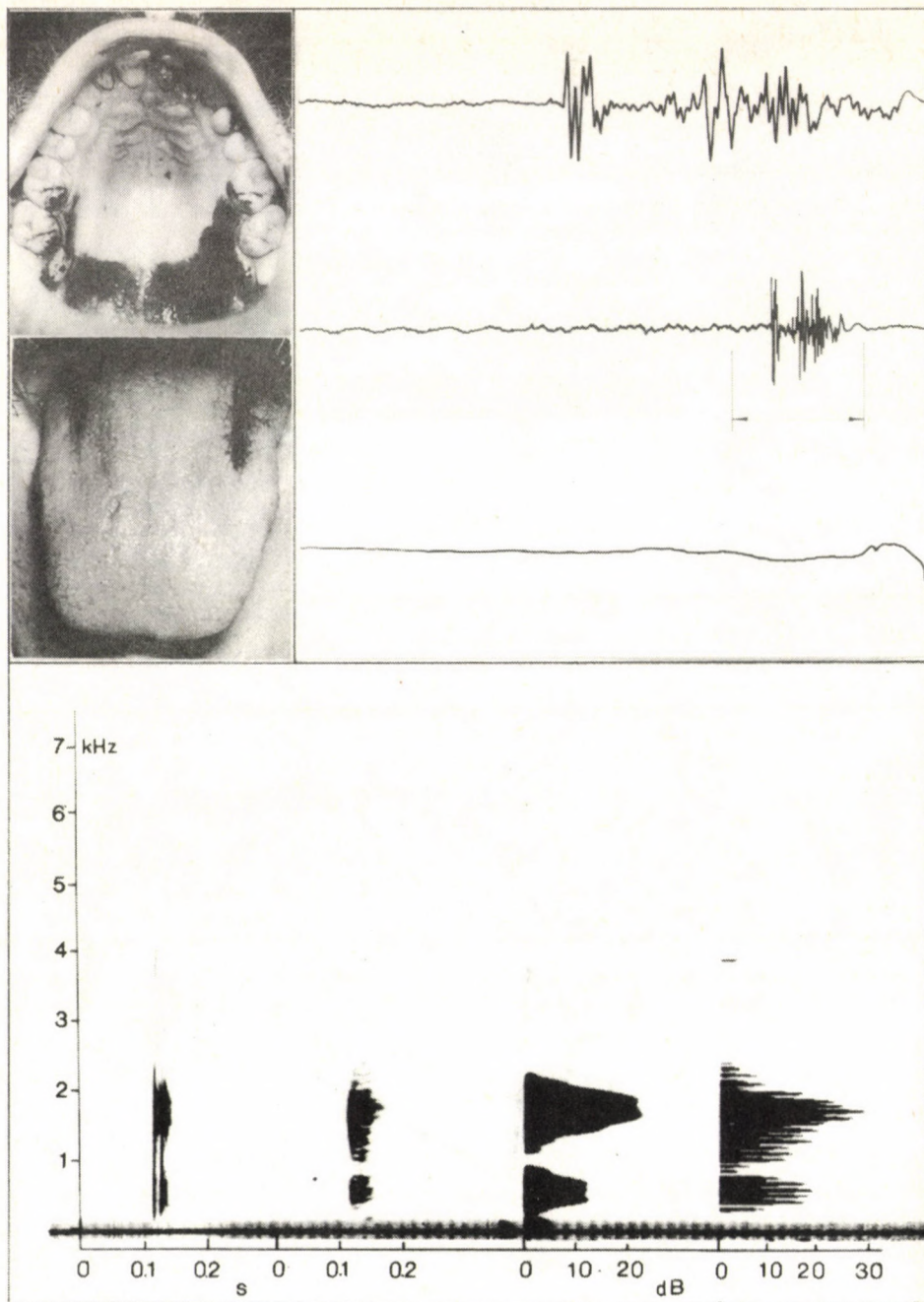
	
	<p> <i>[g']</i> <i>[g'itara]</i> <i>gitara</i> <i>[g']</i> <i>[g'itara]</i> </p> <p style="text-align: right; font-size: 2em;">49</p>
	

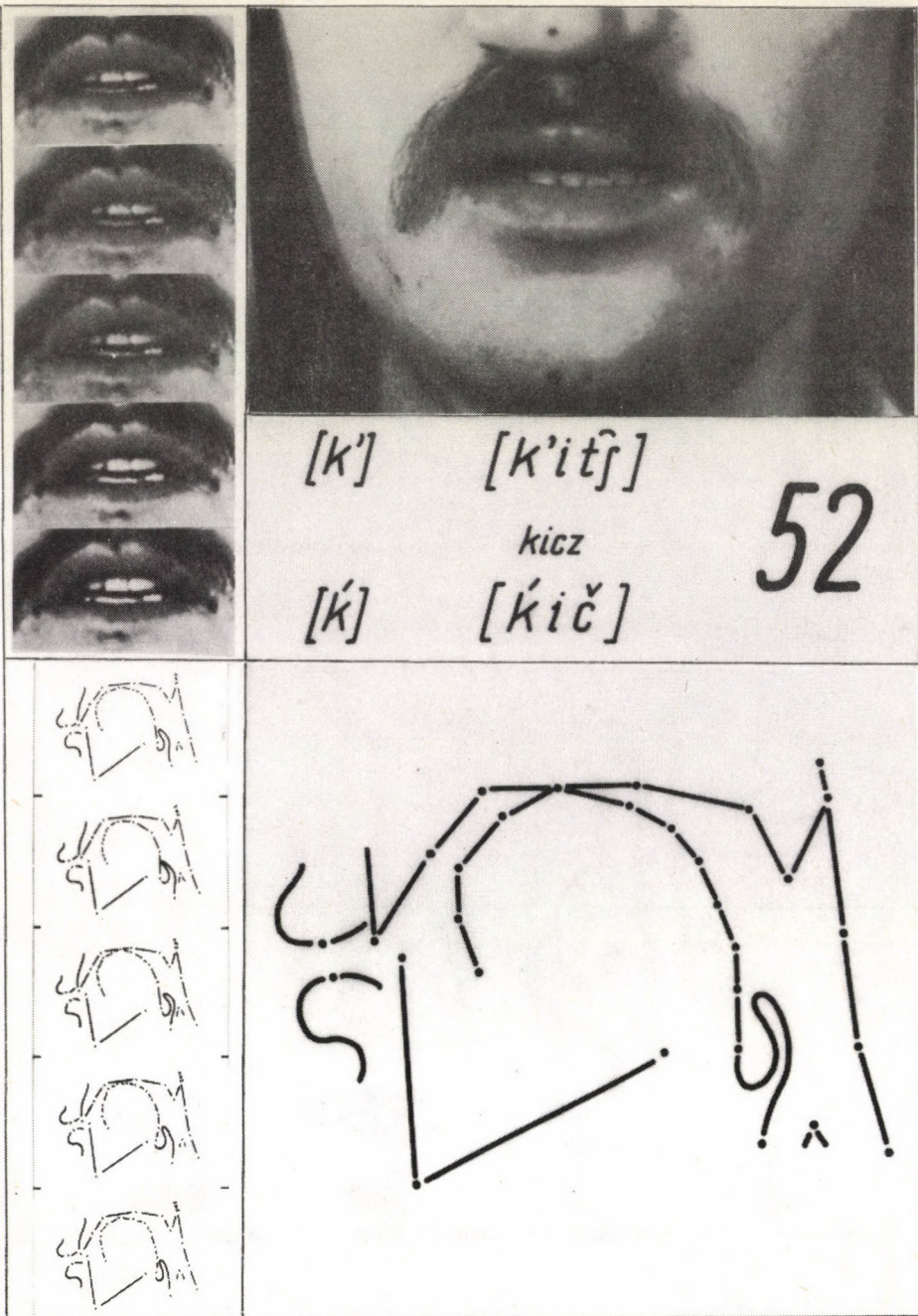


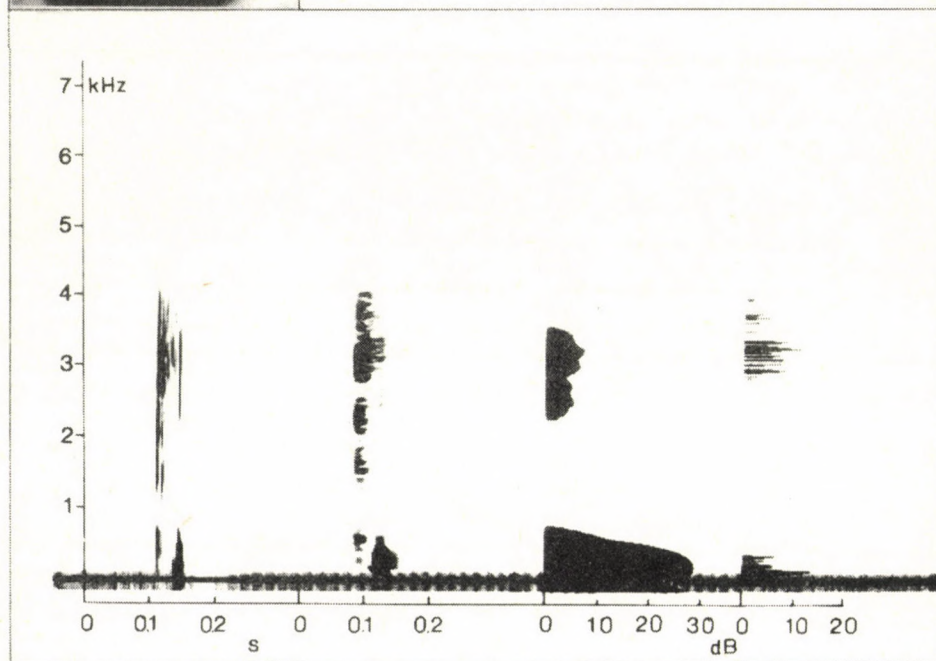
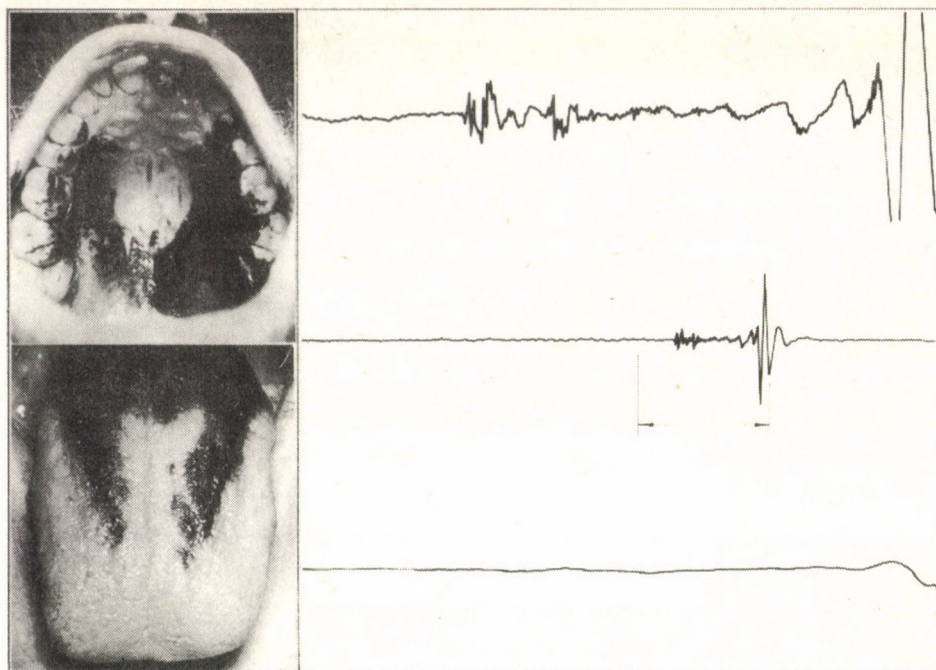
									
	<table> <tr> <td>[g']</td> <td>[mag'a]</td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">50</td> </tr> <tr> <td></td> <td><i>magia</i></td> </tr> <tr> <td>[g']</td> <td>[ma'gà]</td> <td></td> </tr> </table>	[g']	[mag'a]	50		<i>magia</i>	[g']	[ma'gà]	
[g']	[mag'a]	50							
	<i>magia</i>								
[g']	[ma'gà]								
									

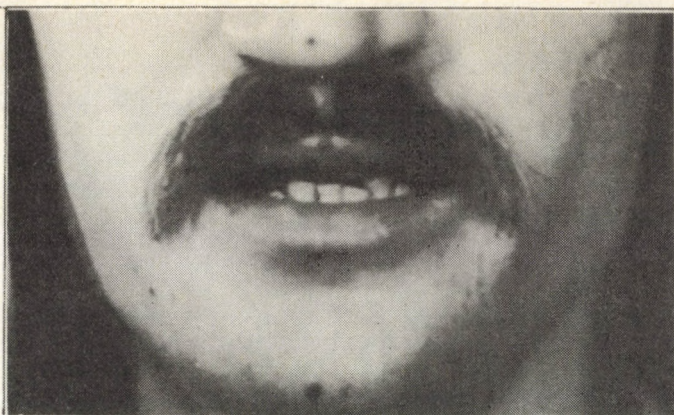
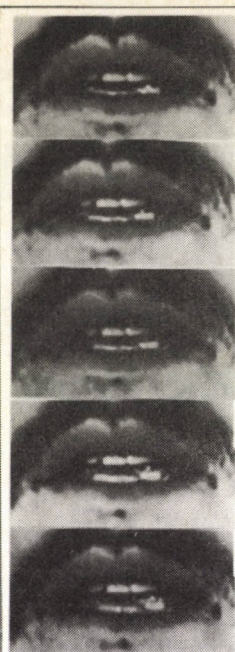












[kʰ]

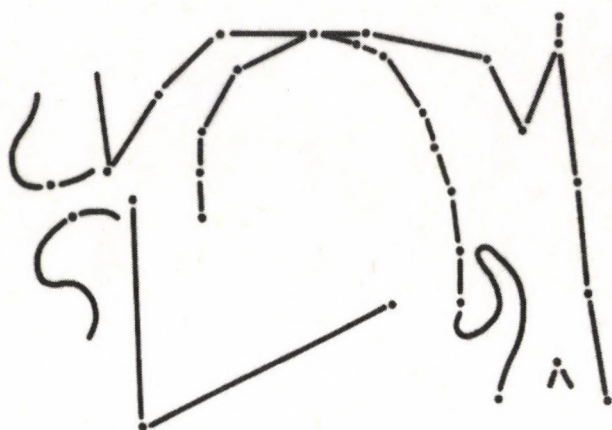
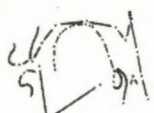
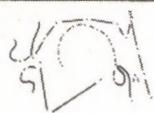
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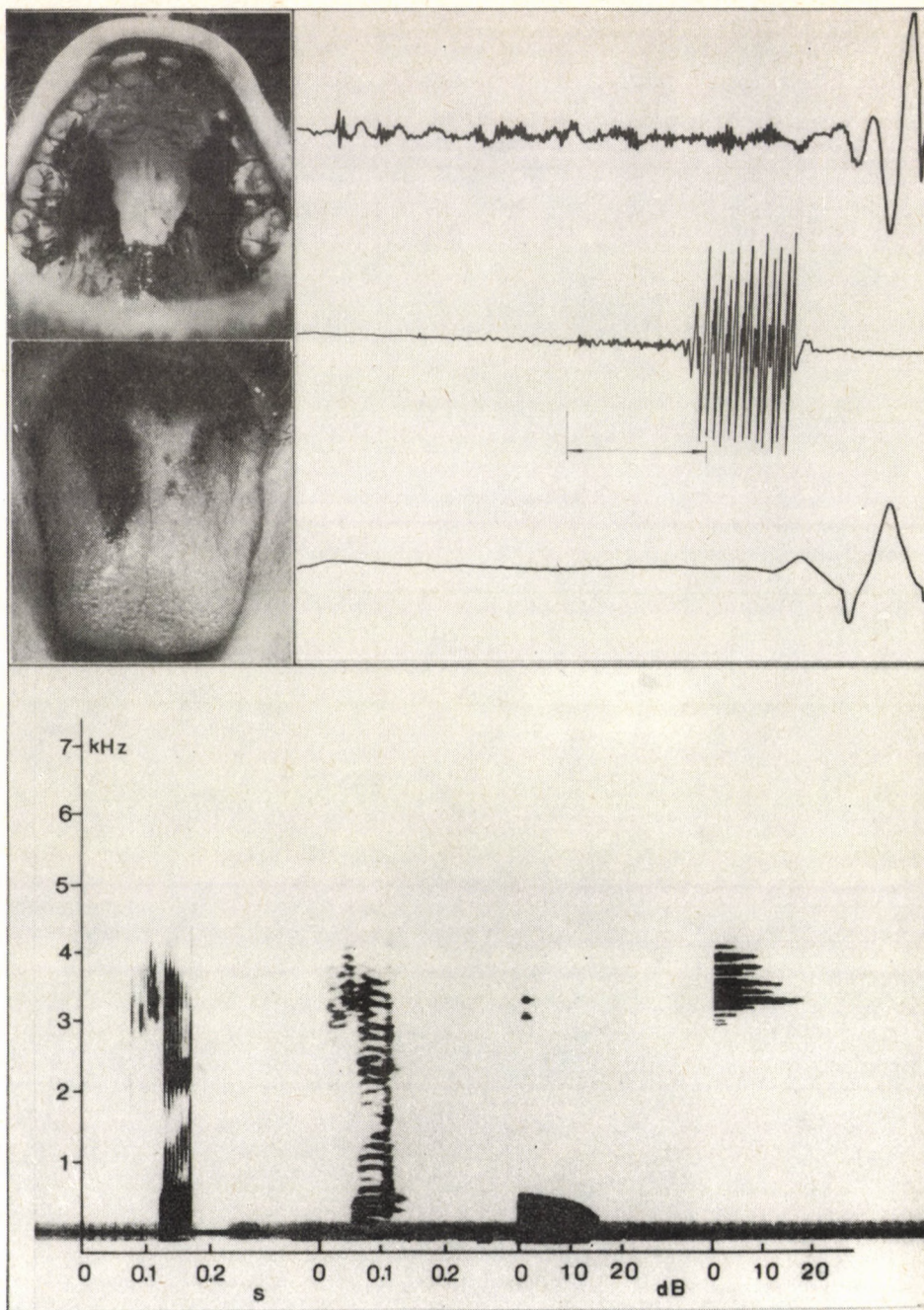
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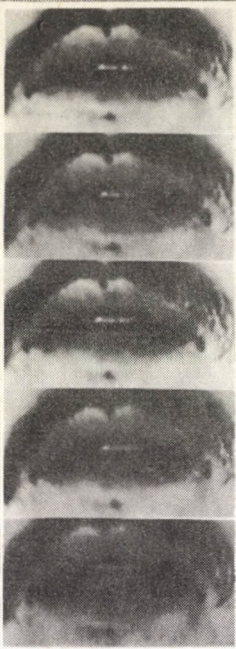
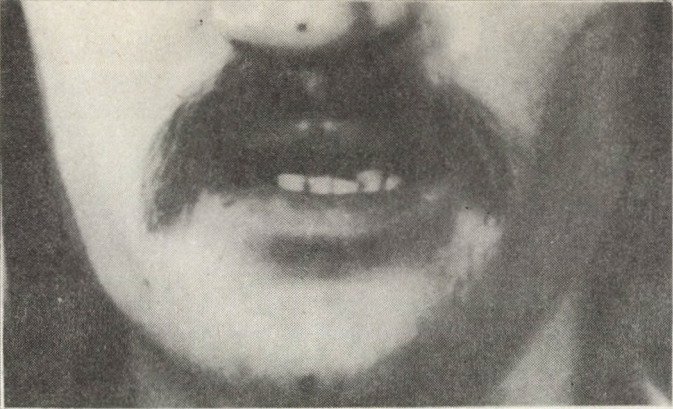
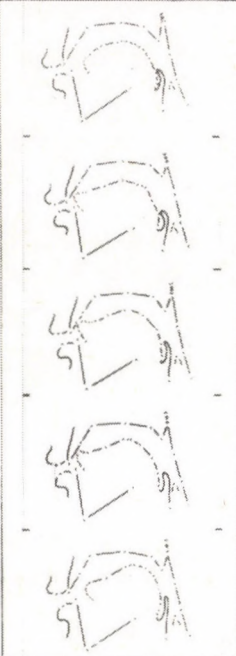

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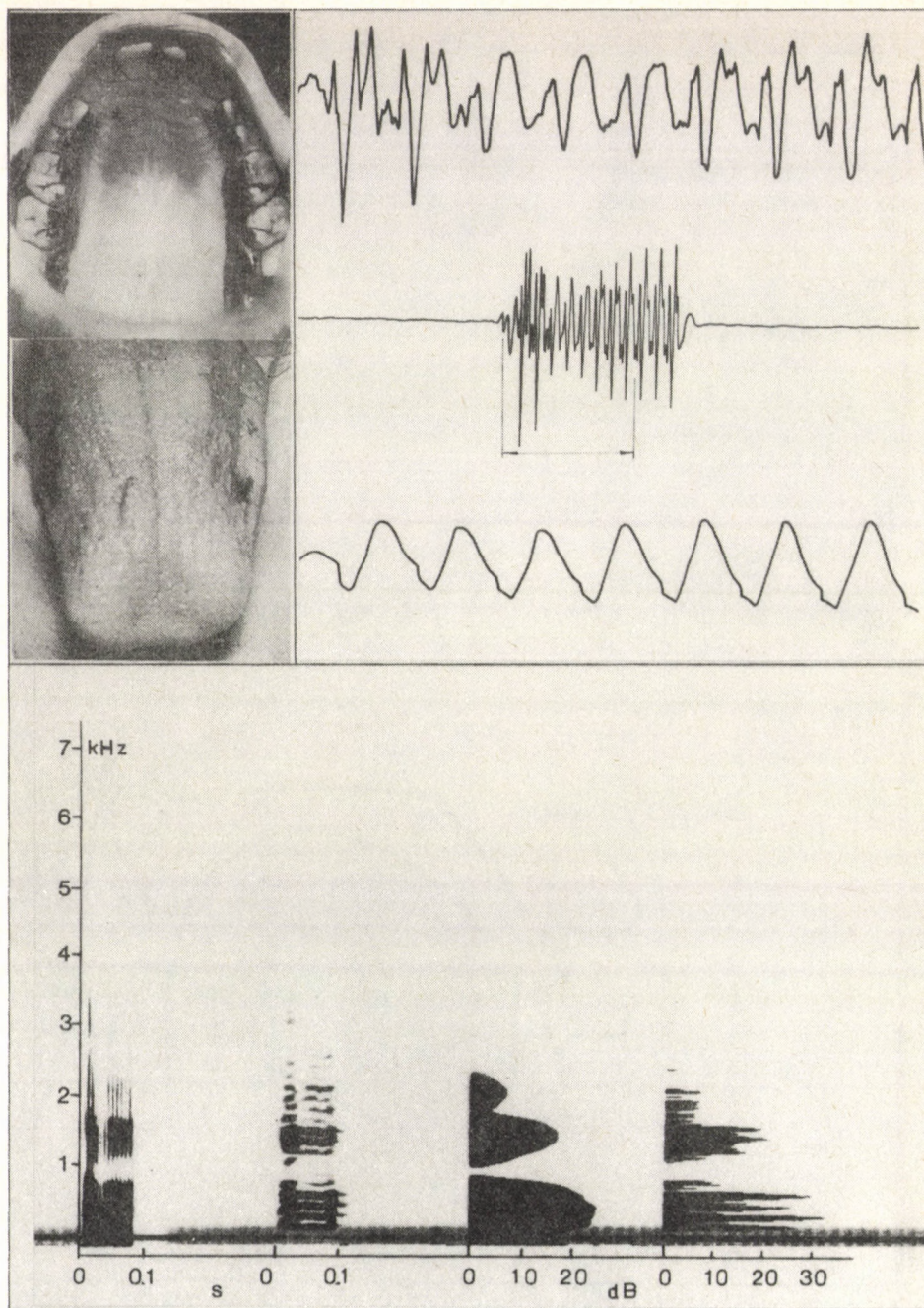
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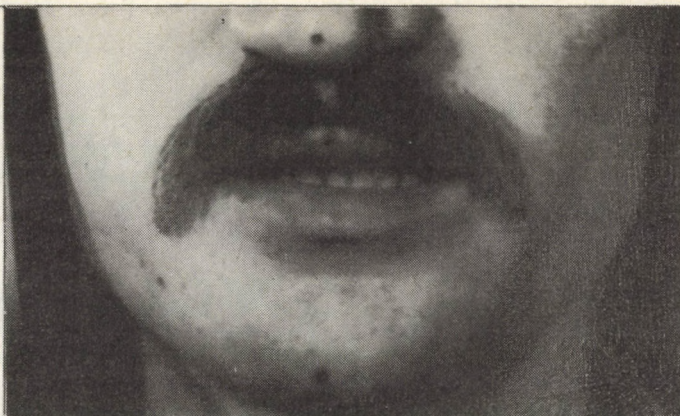
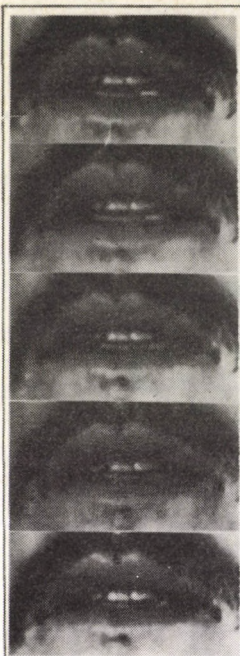
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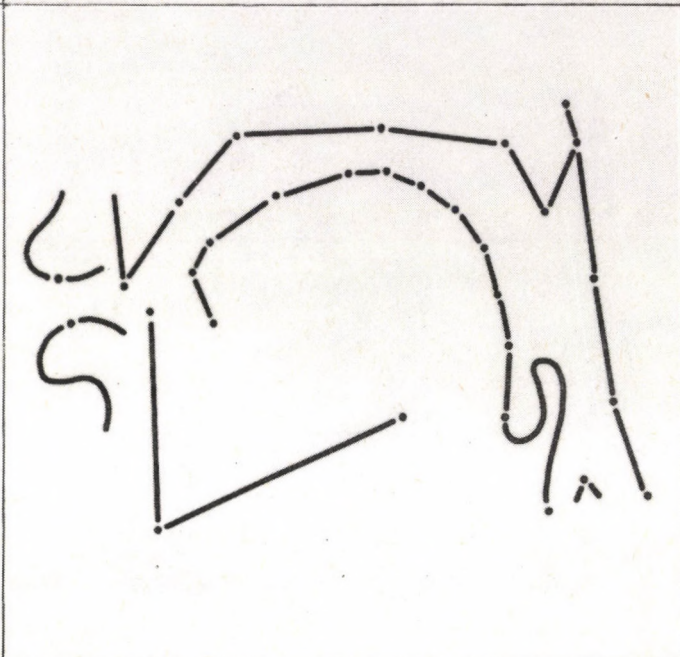
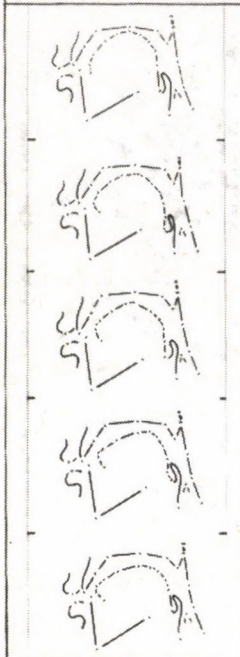


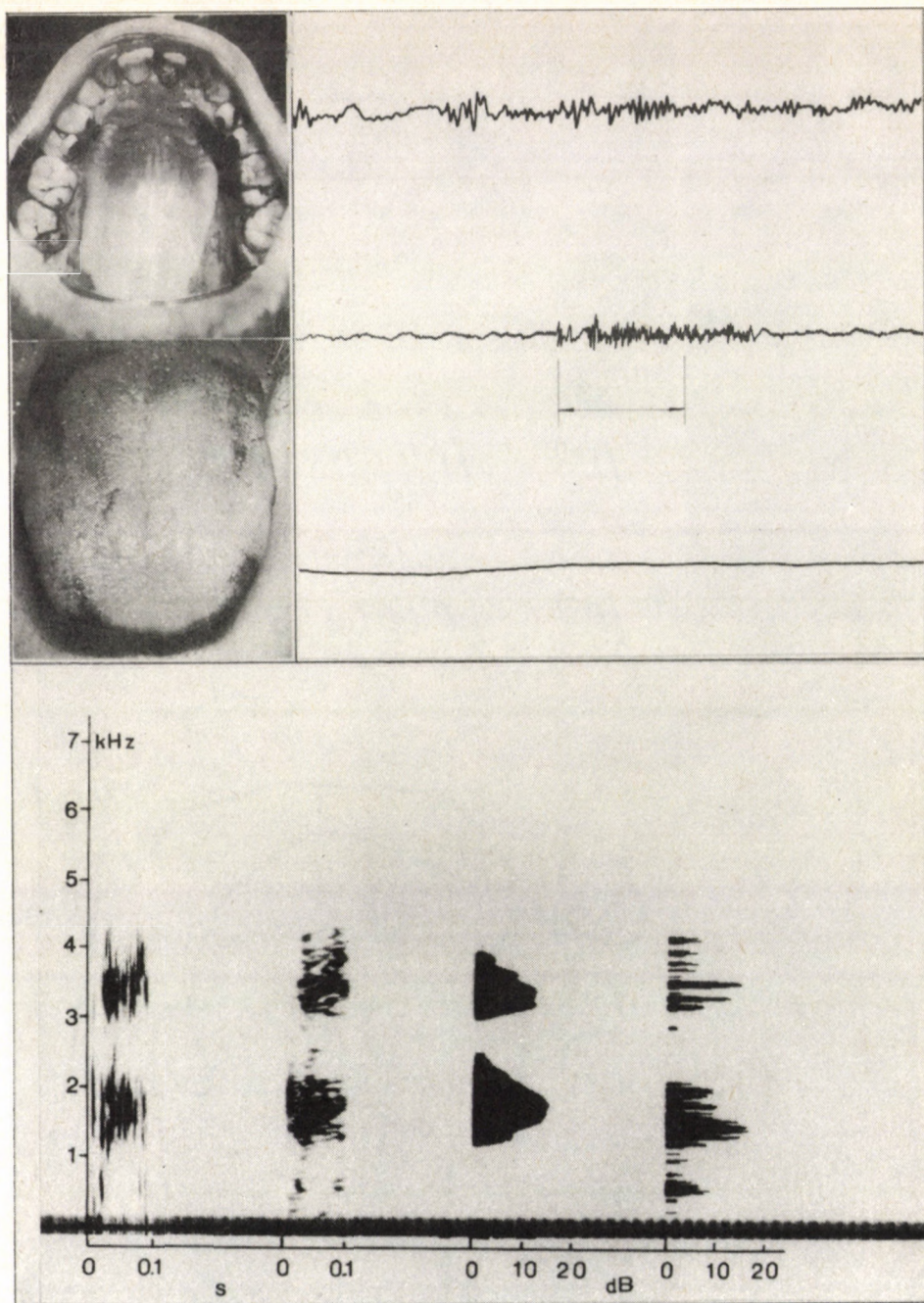
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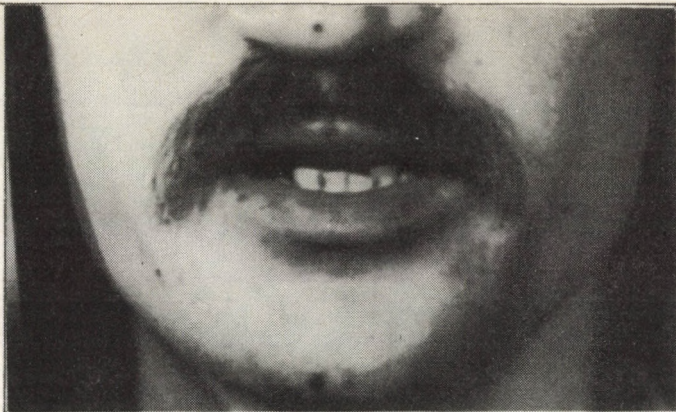
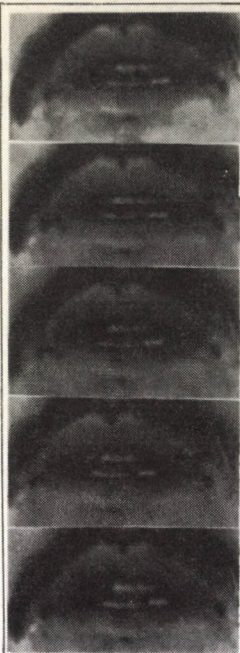
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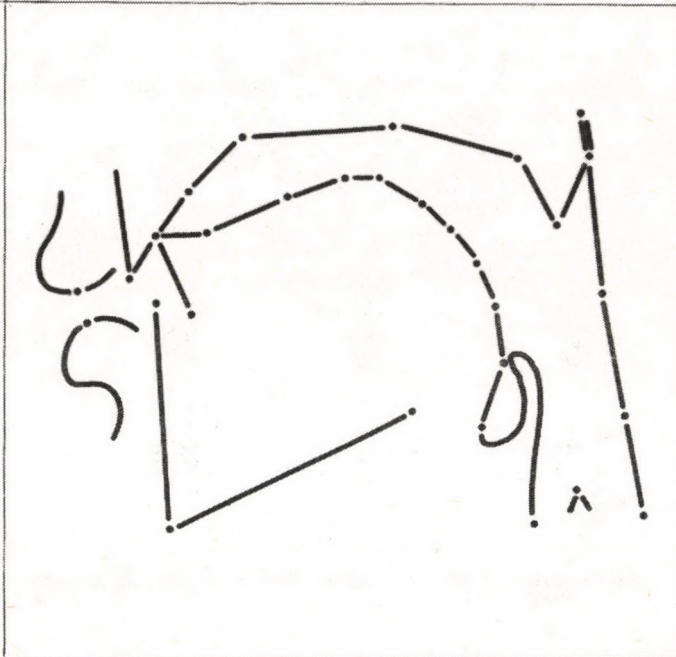
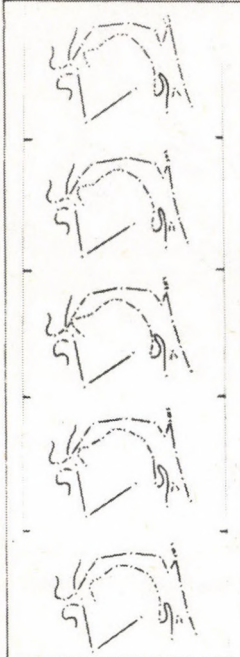


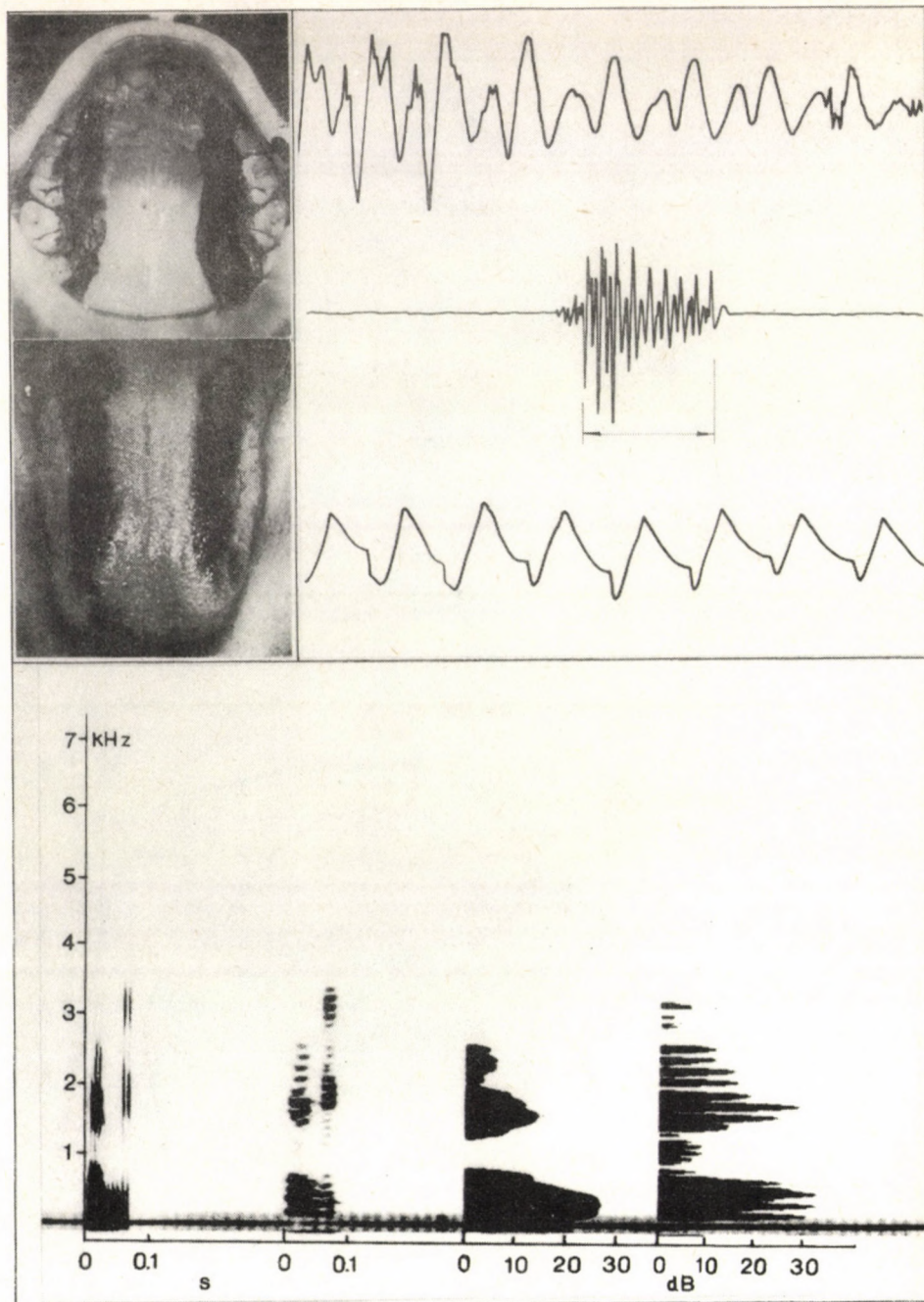
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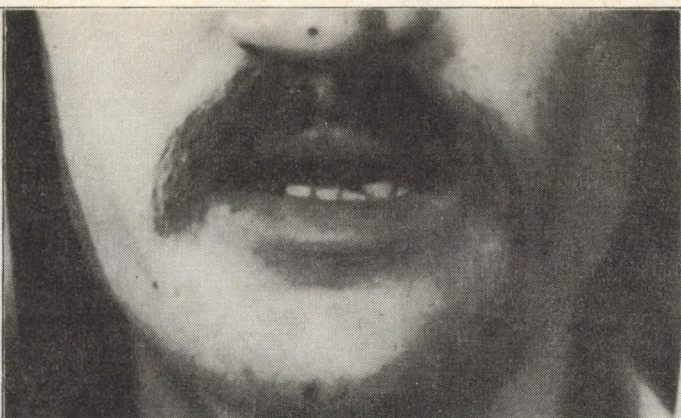
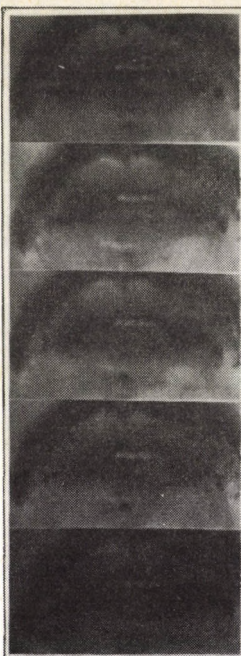
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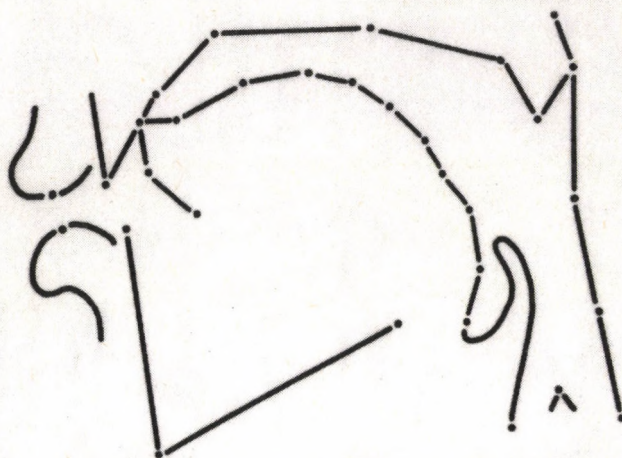
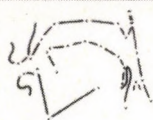


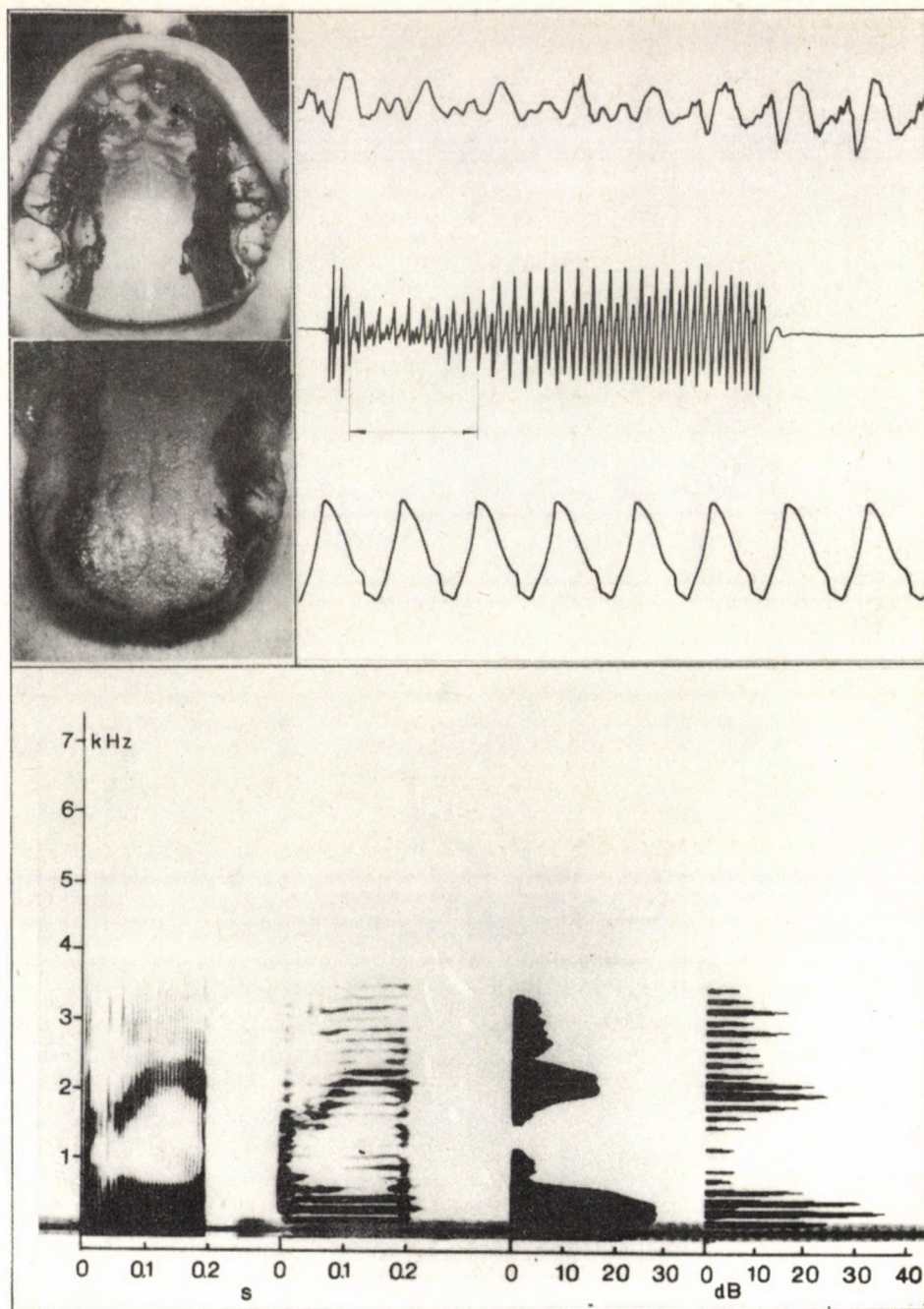
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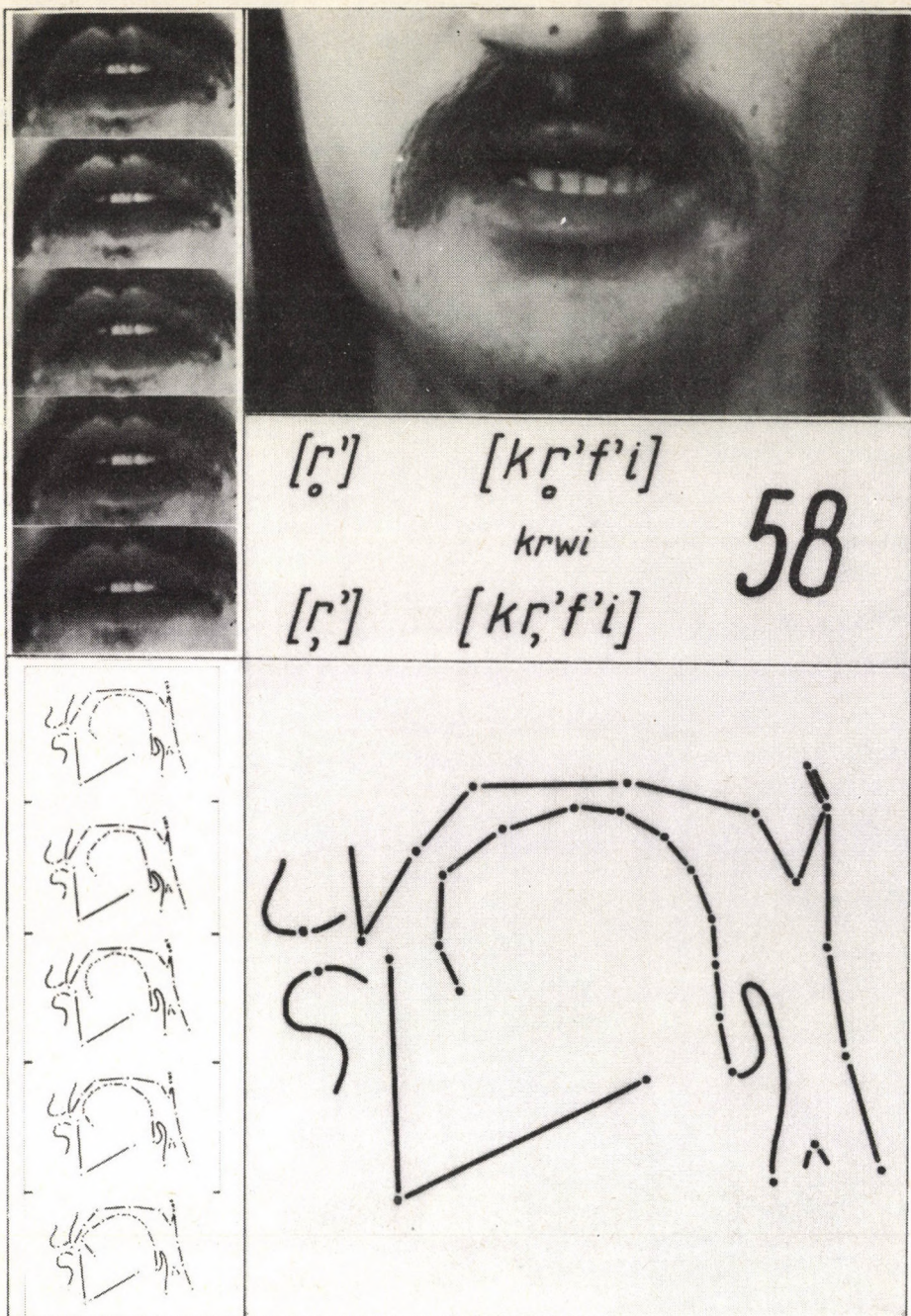
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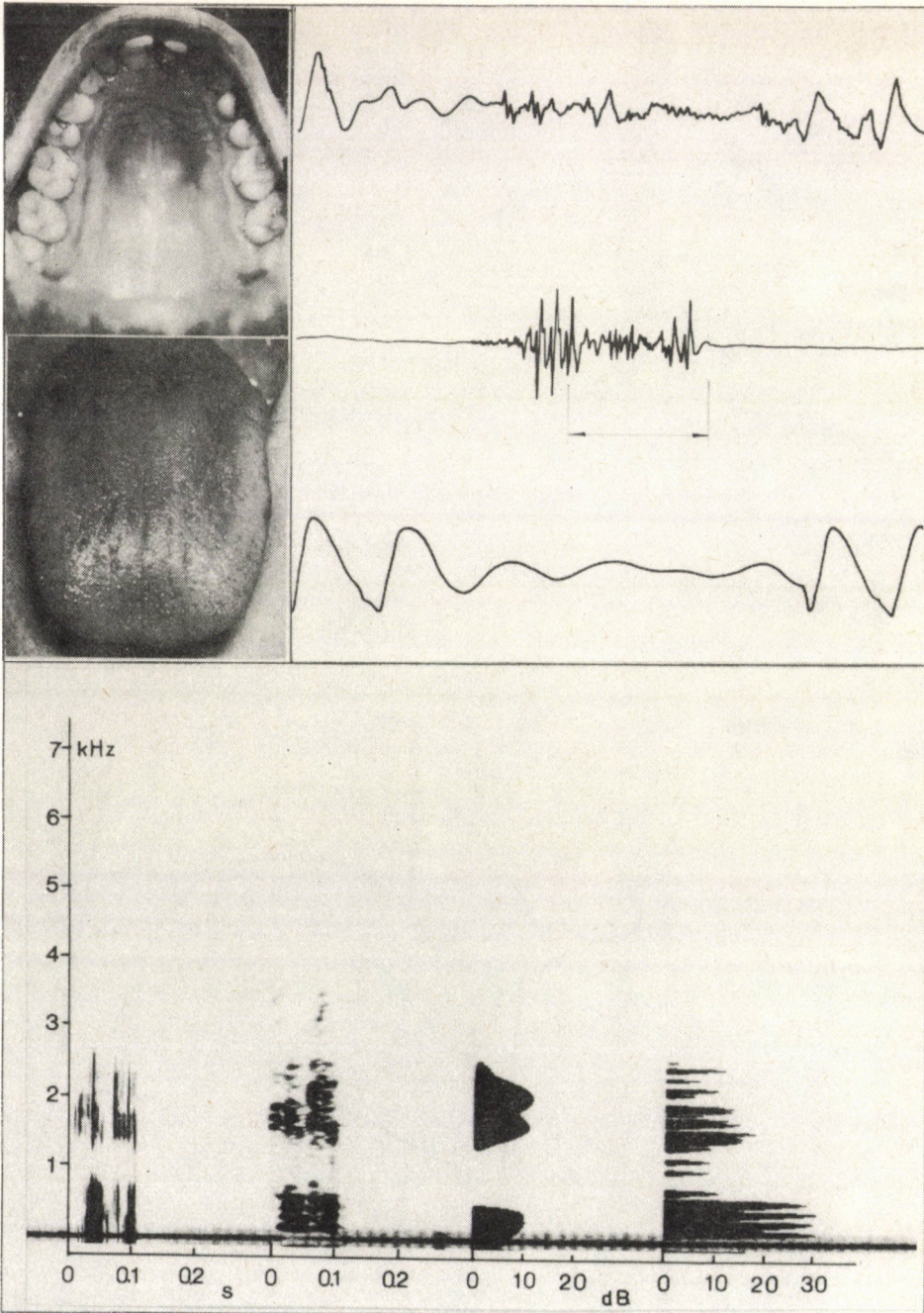
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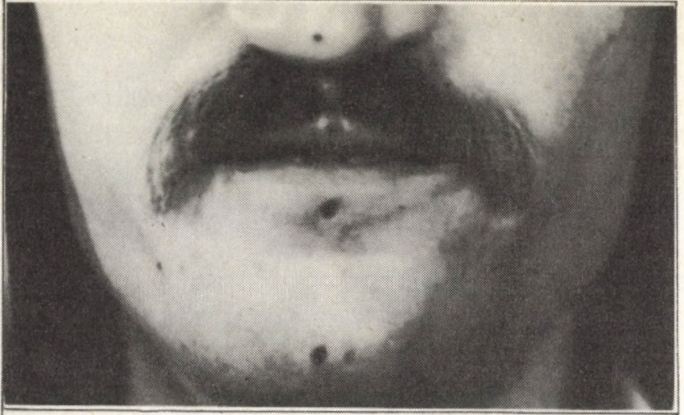
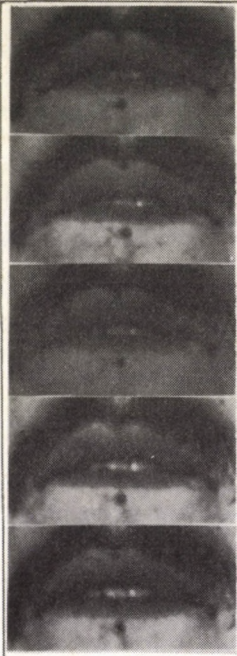
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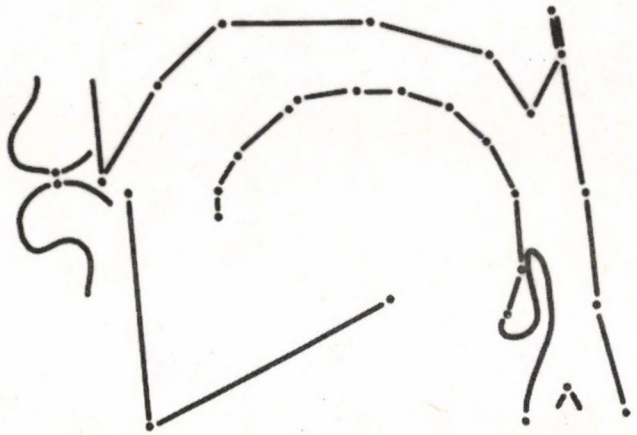


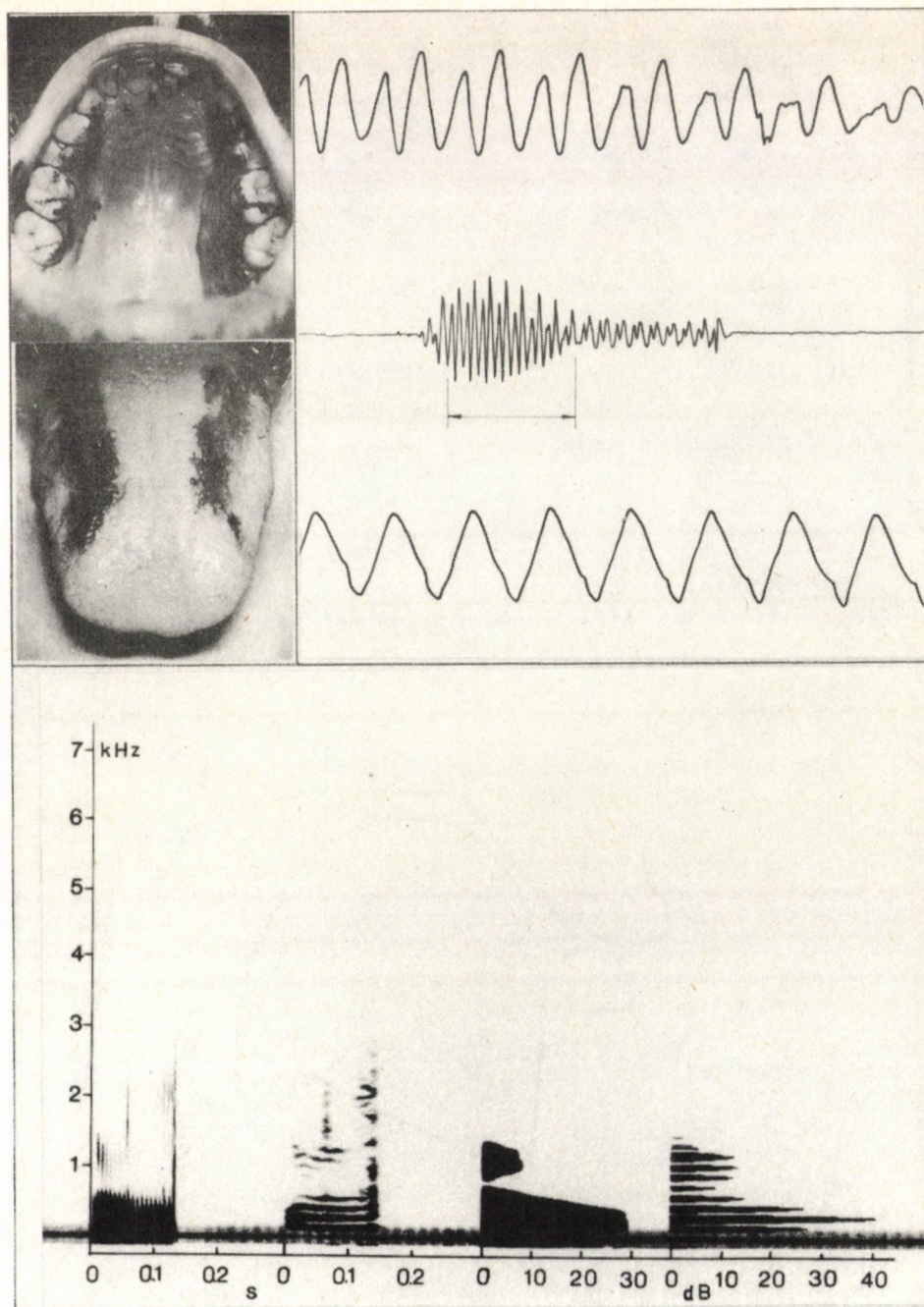
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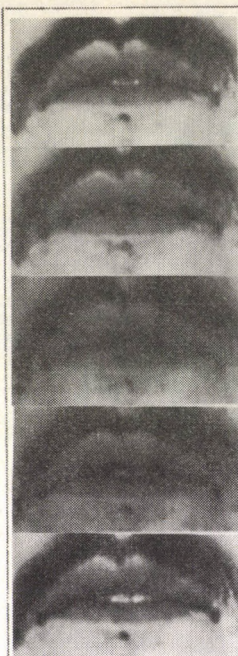
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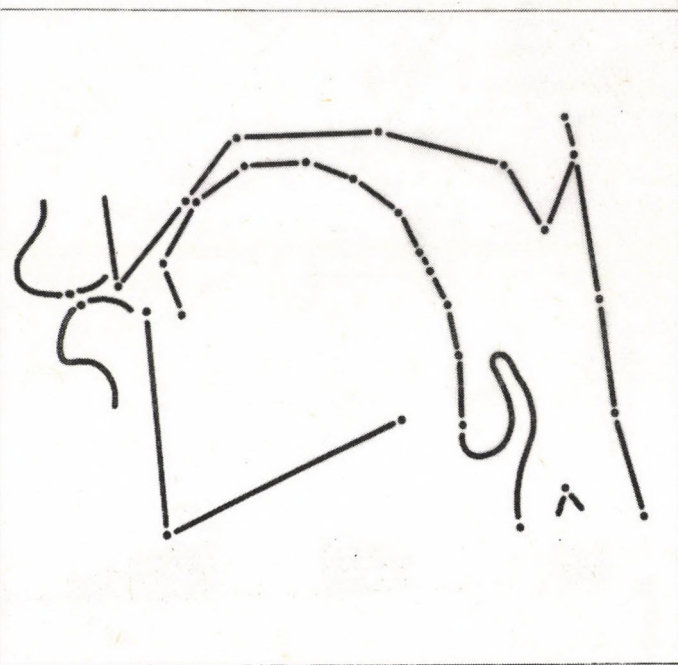
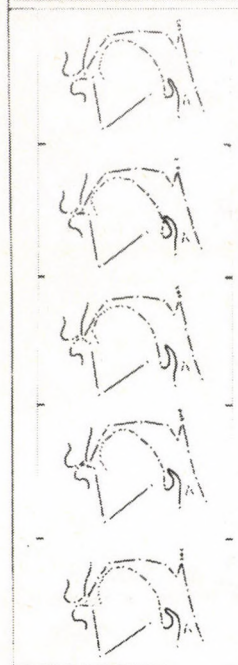


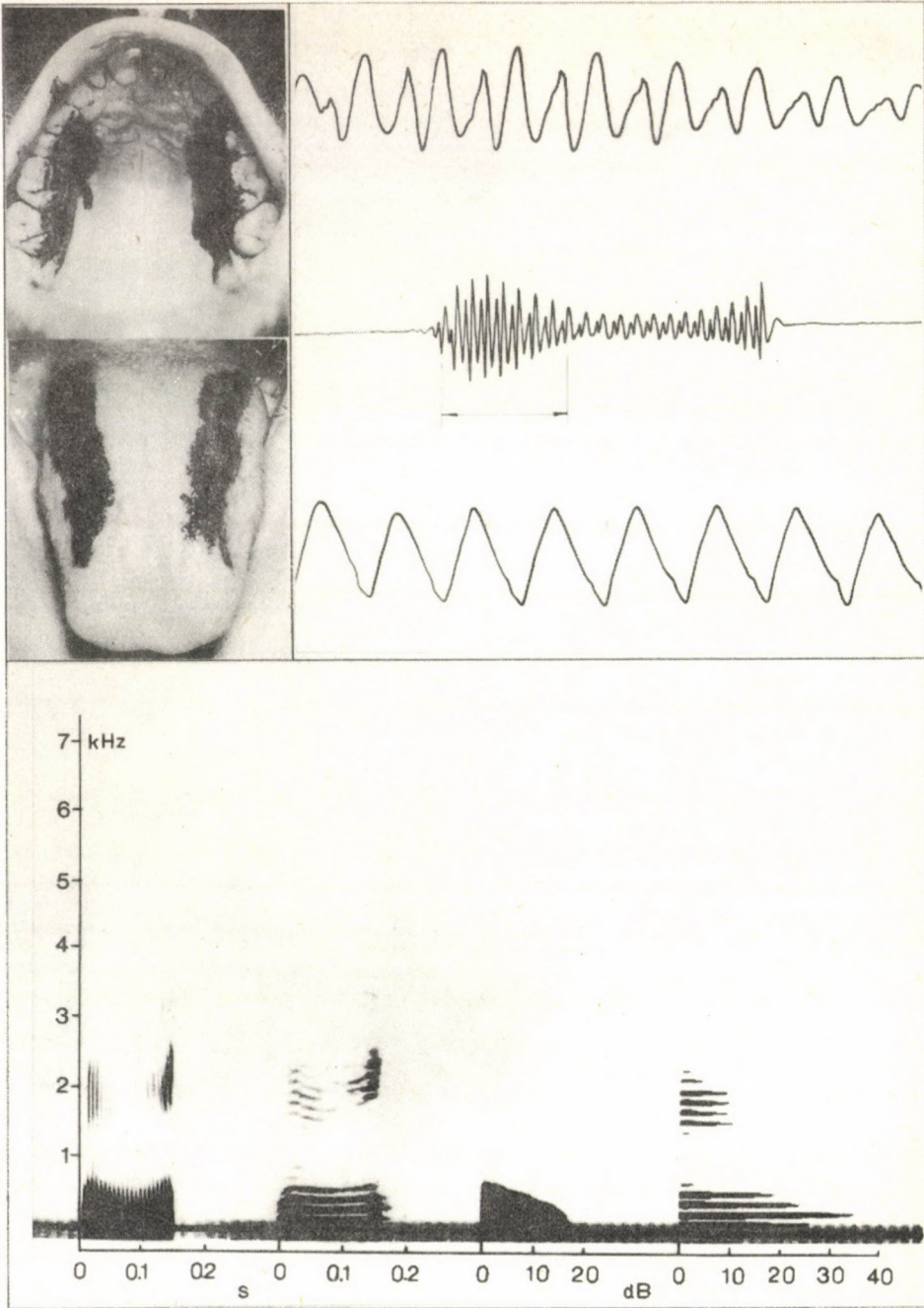
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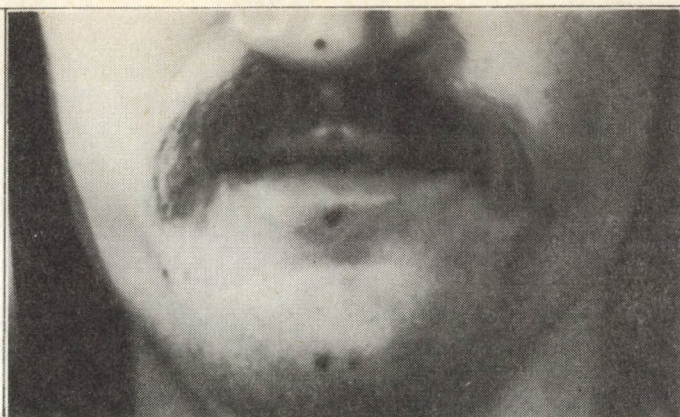
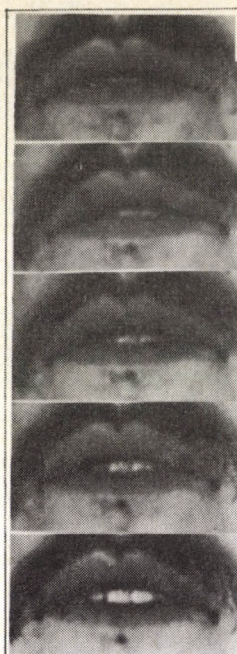
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60







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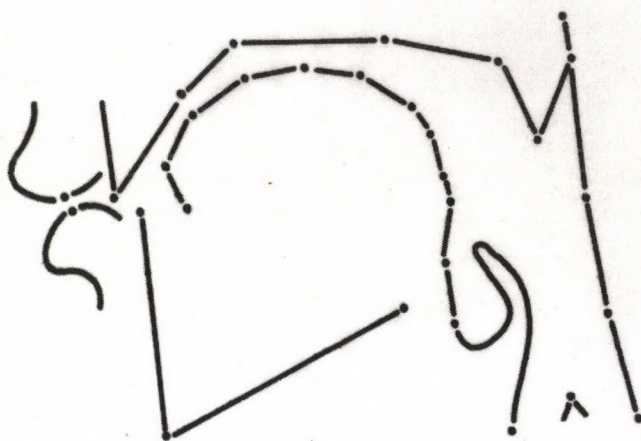
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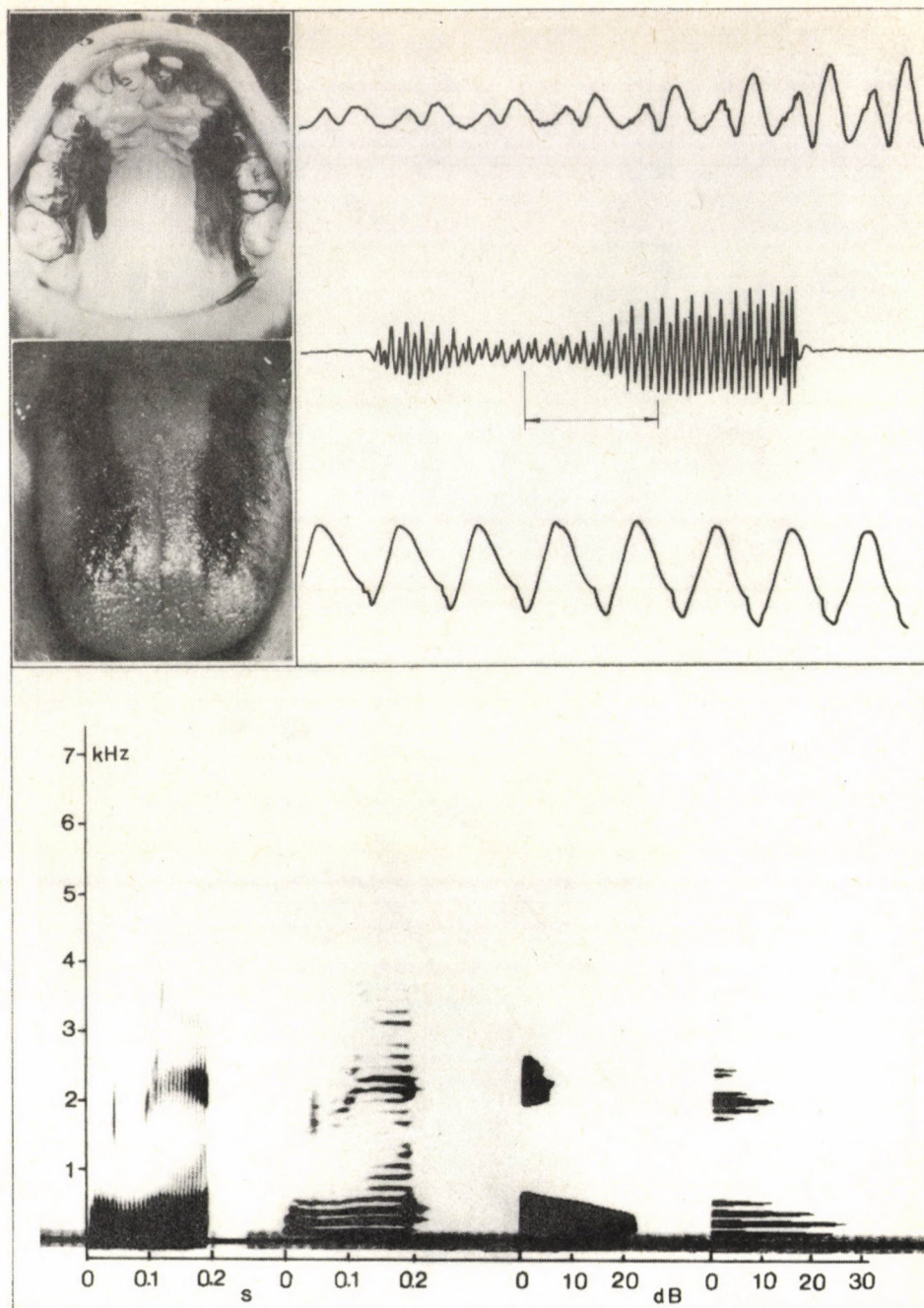
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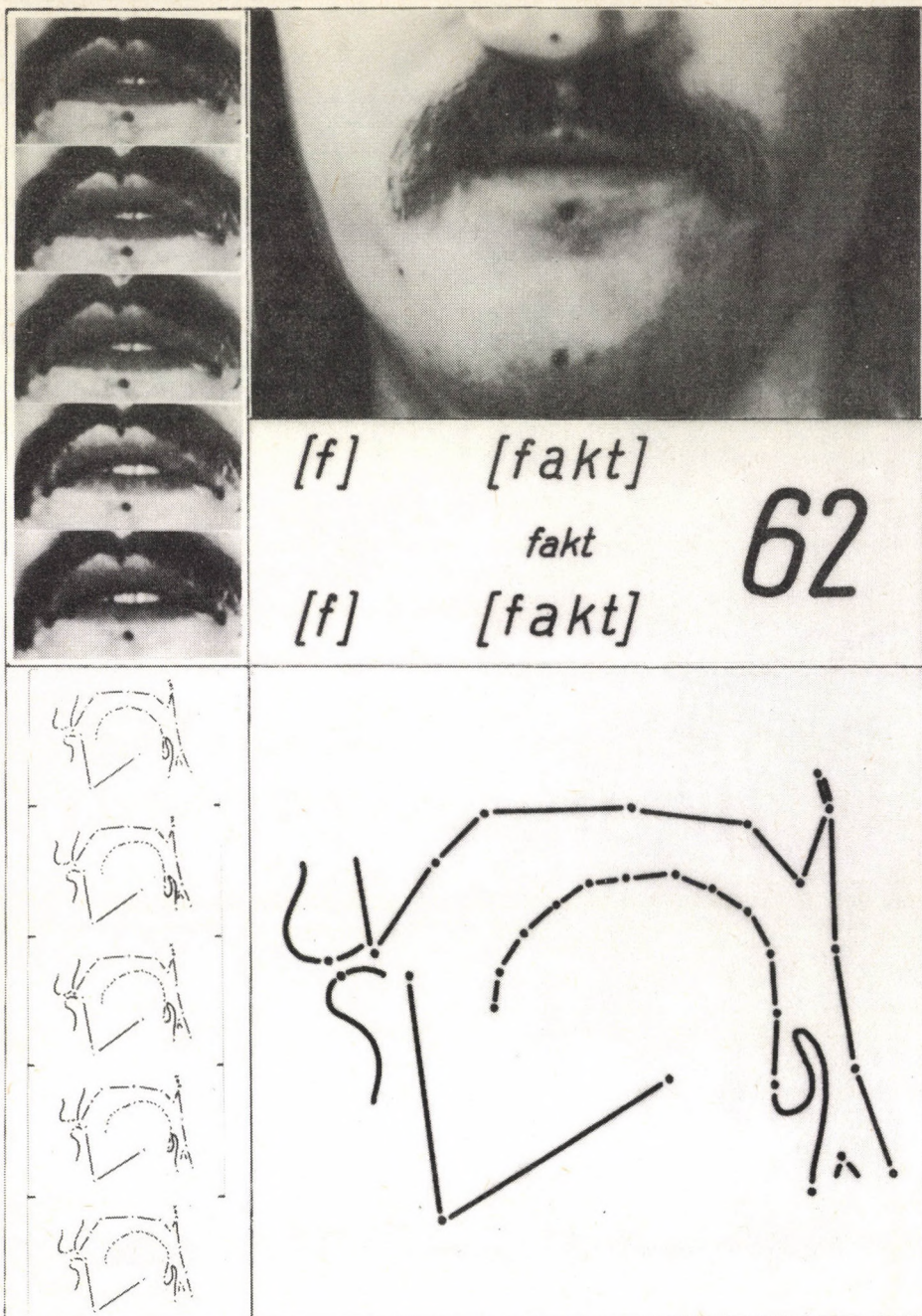
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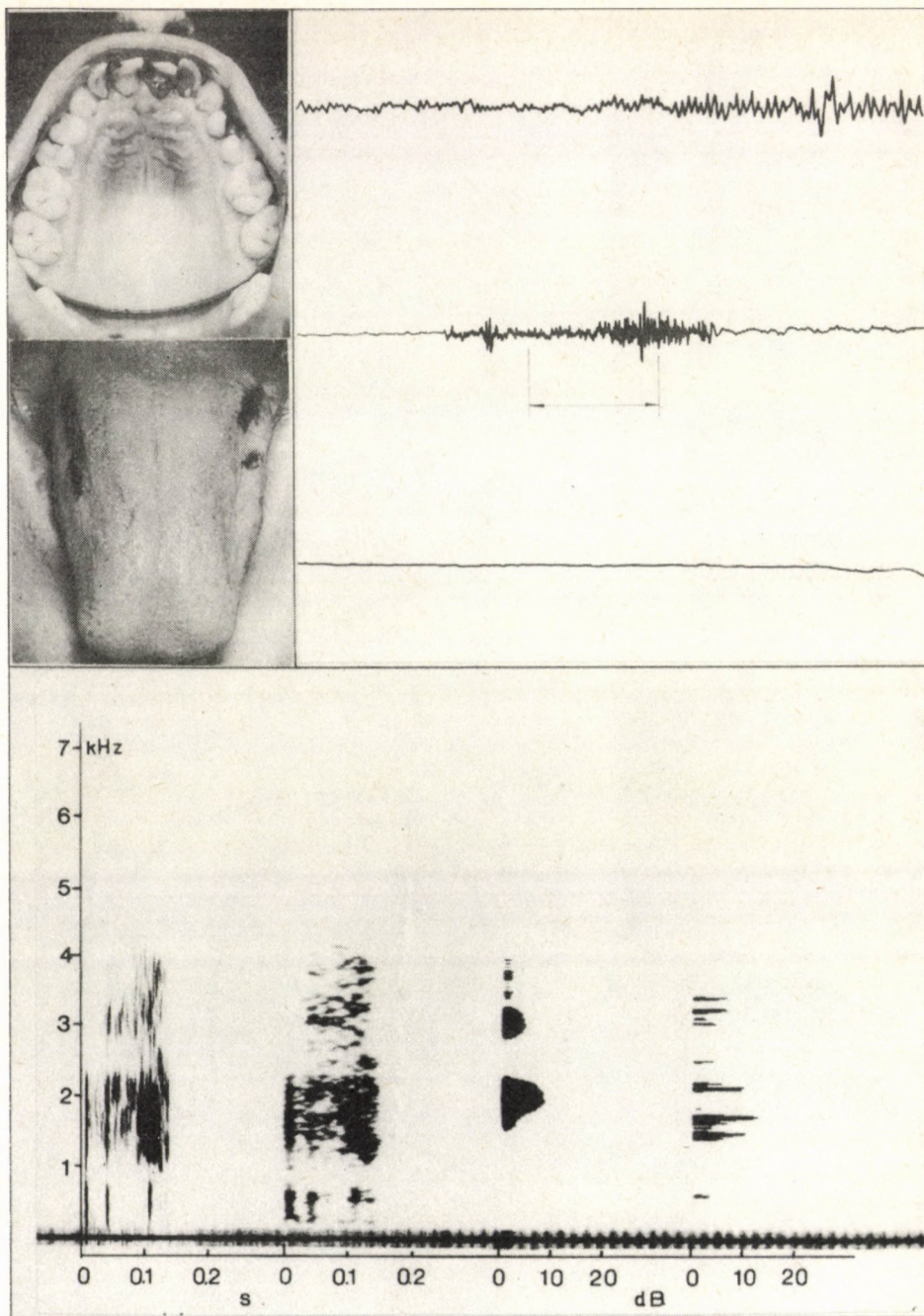
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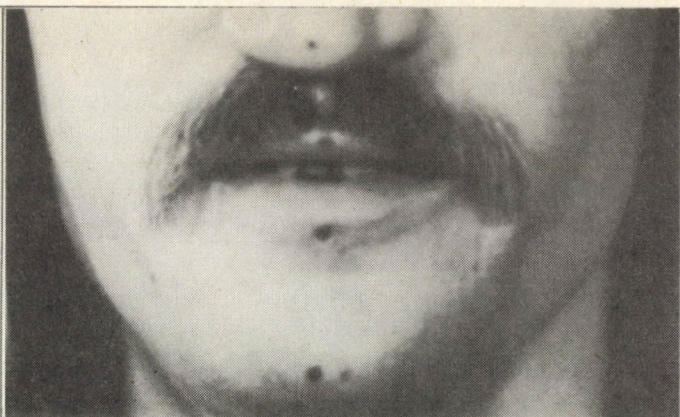
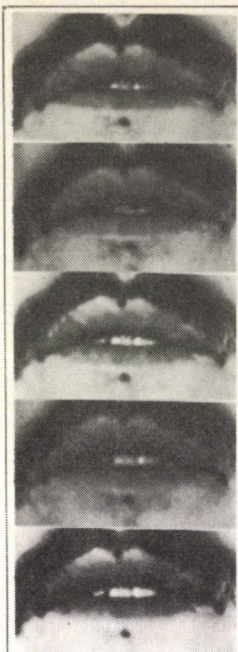
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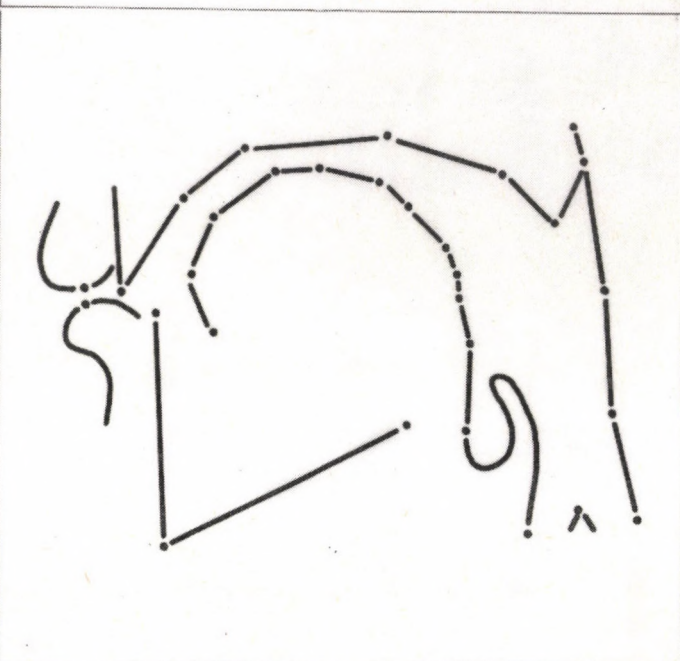
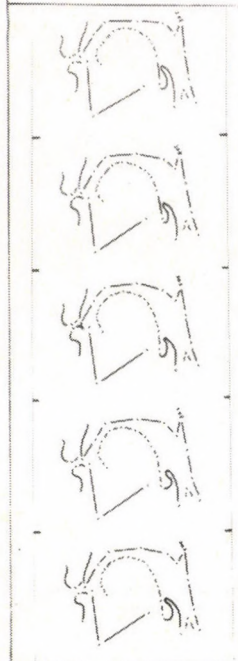
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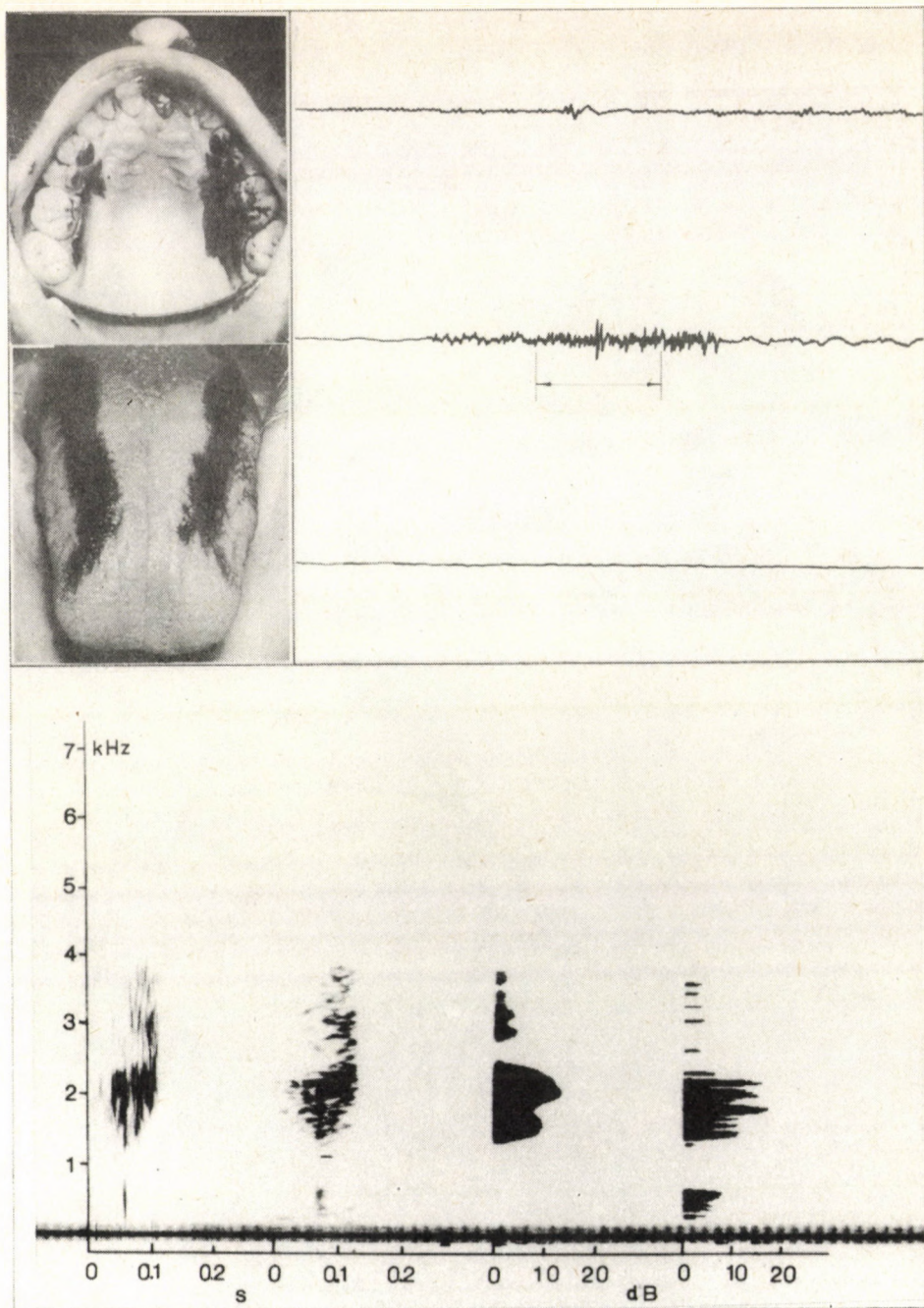
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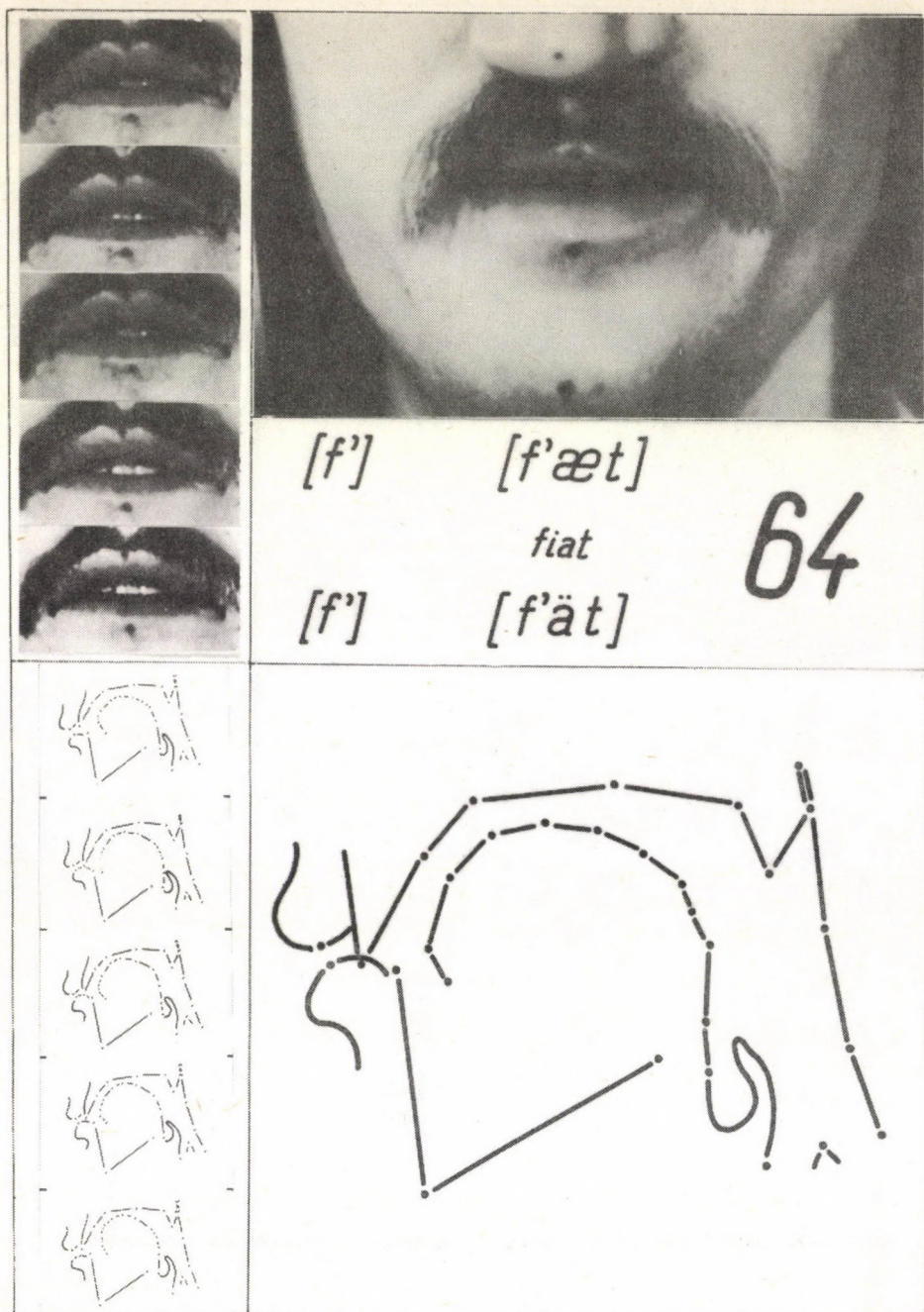
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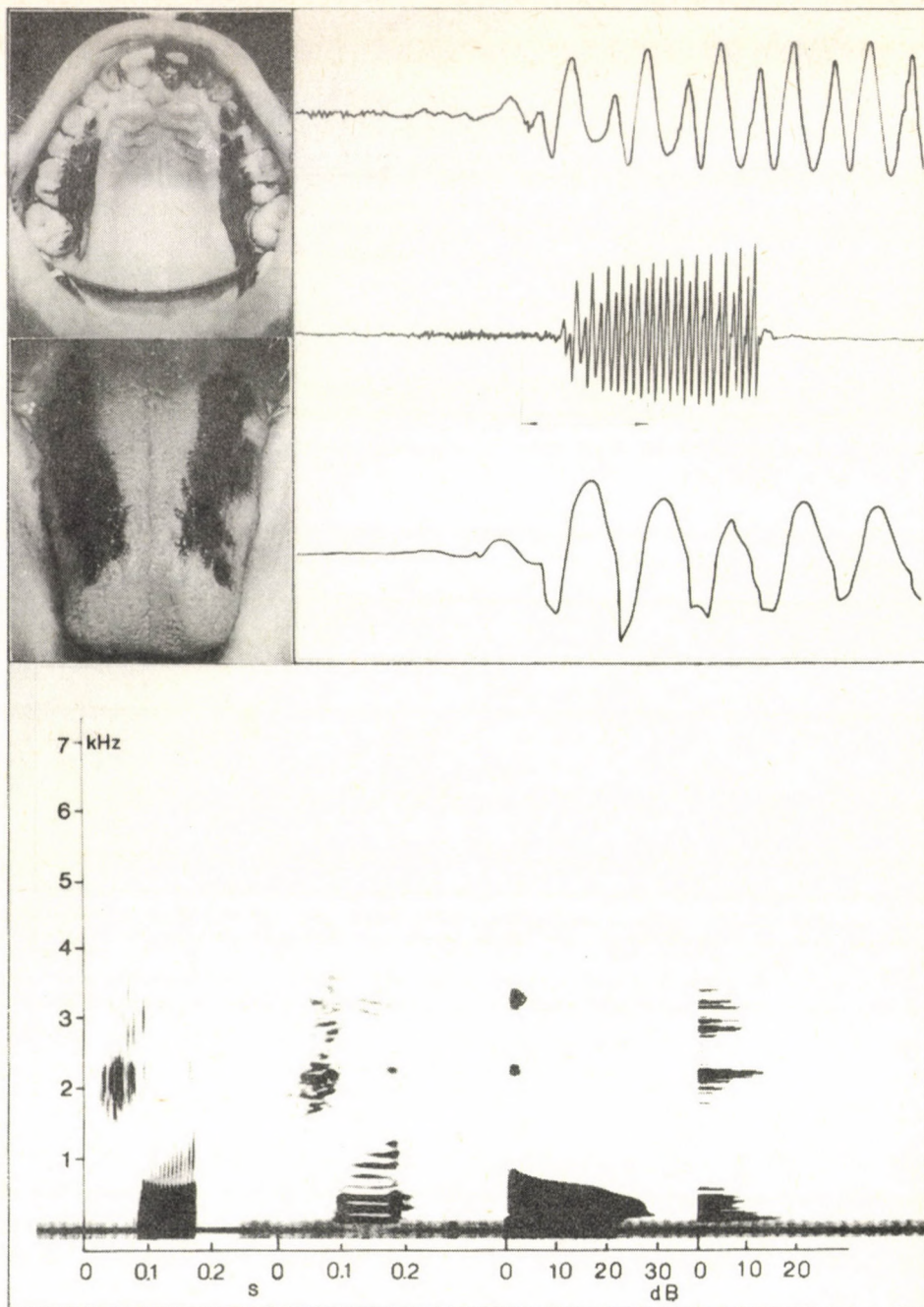
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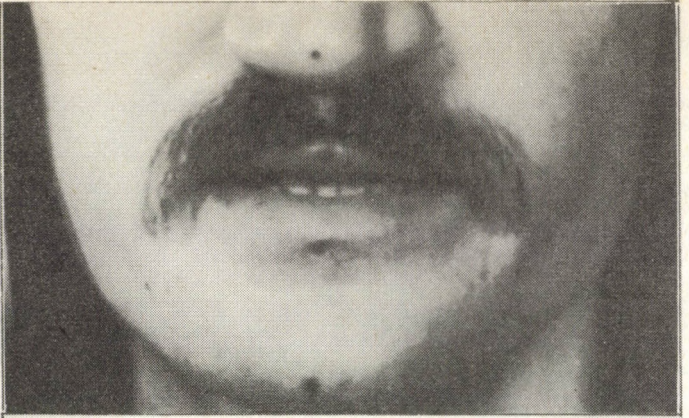
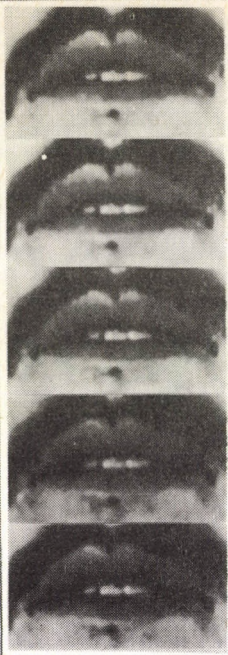
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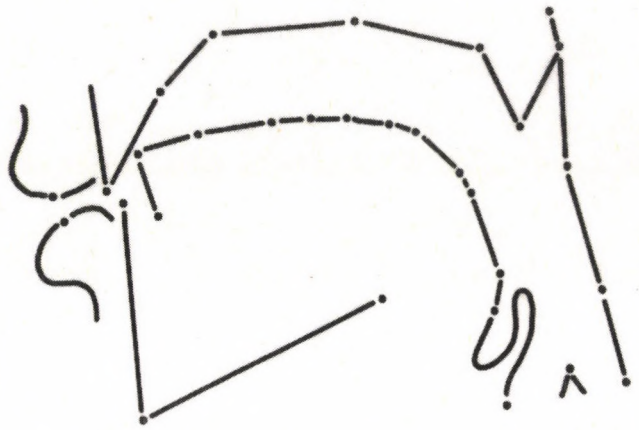


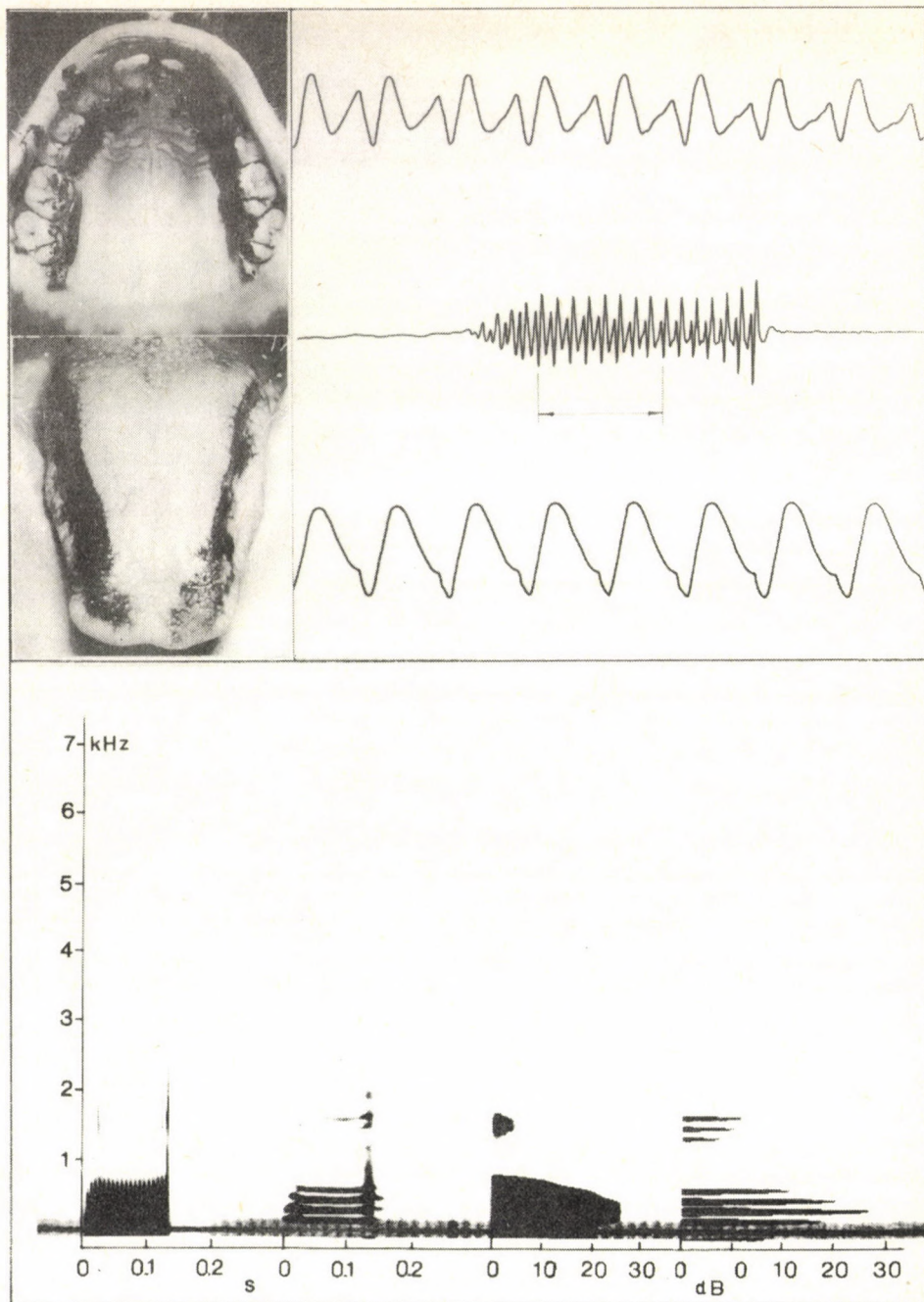
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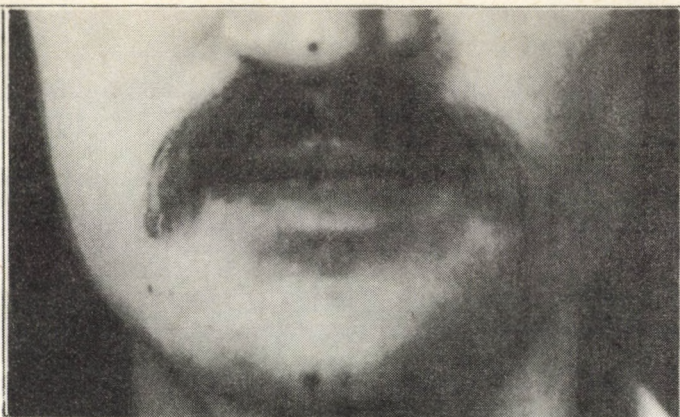
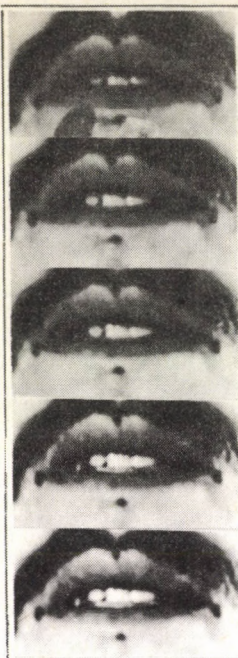
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65





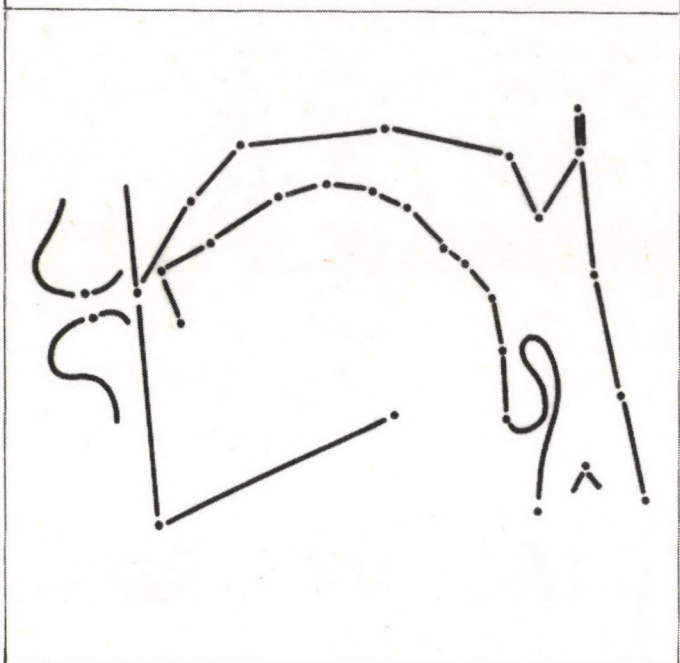


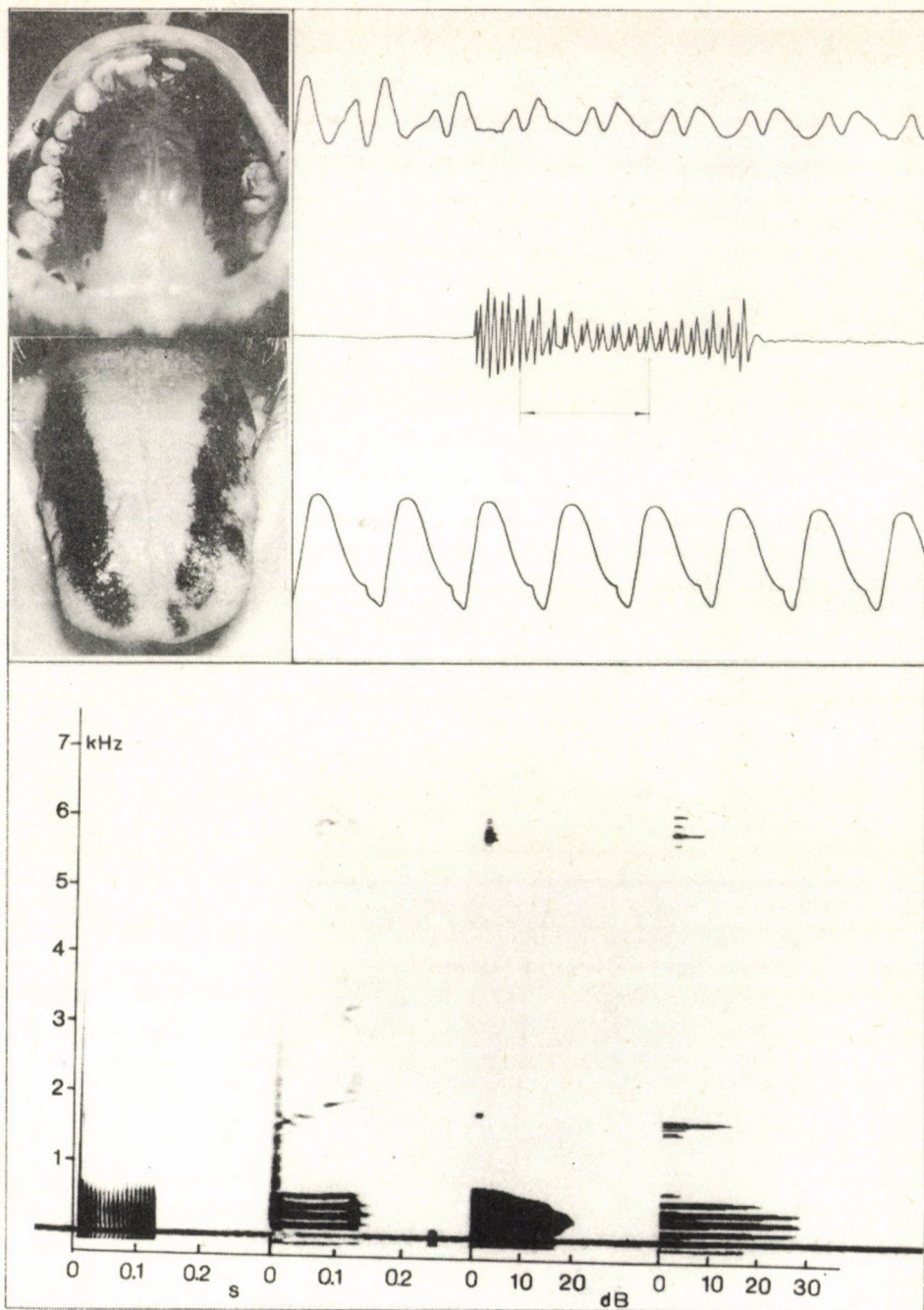
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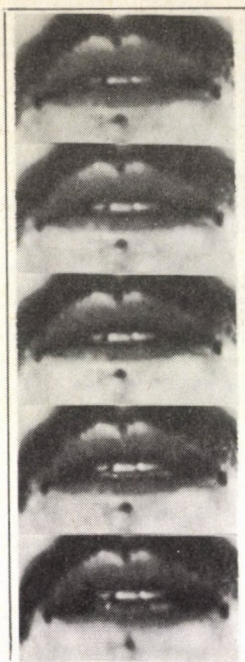
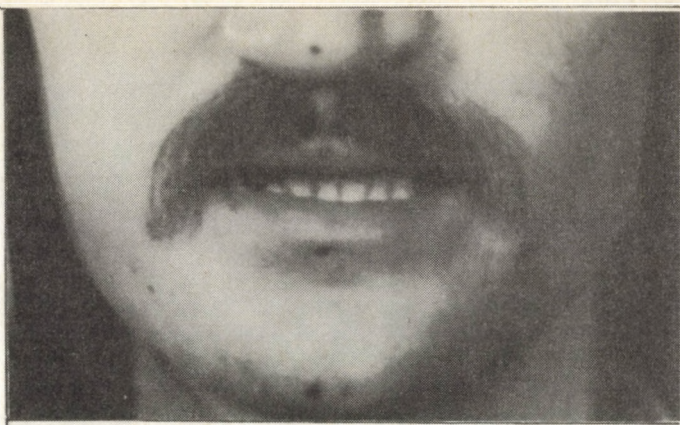
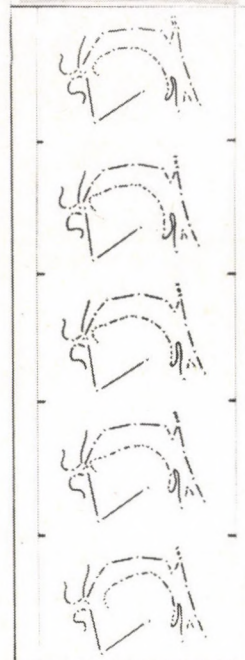
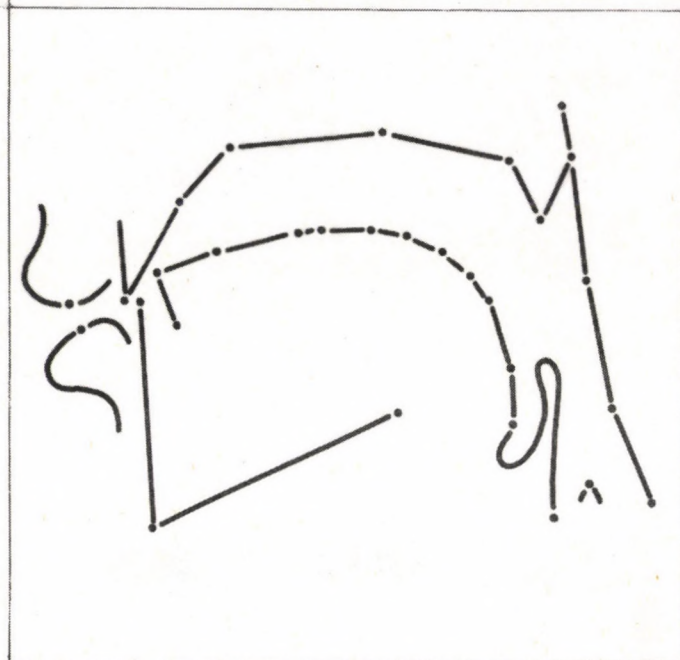
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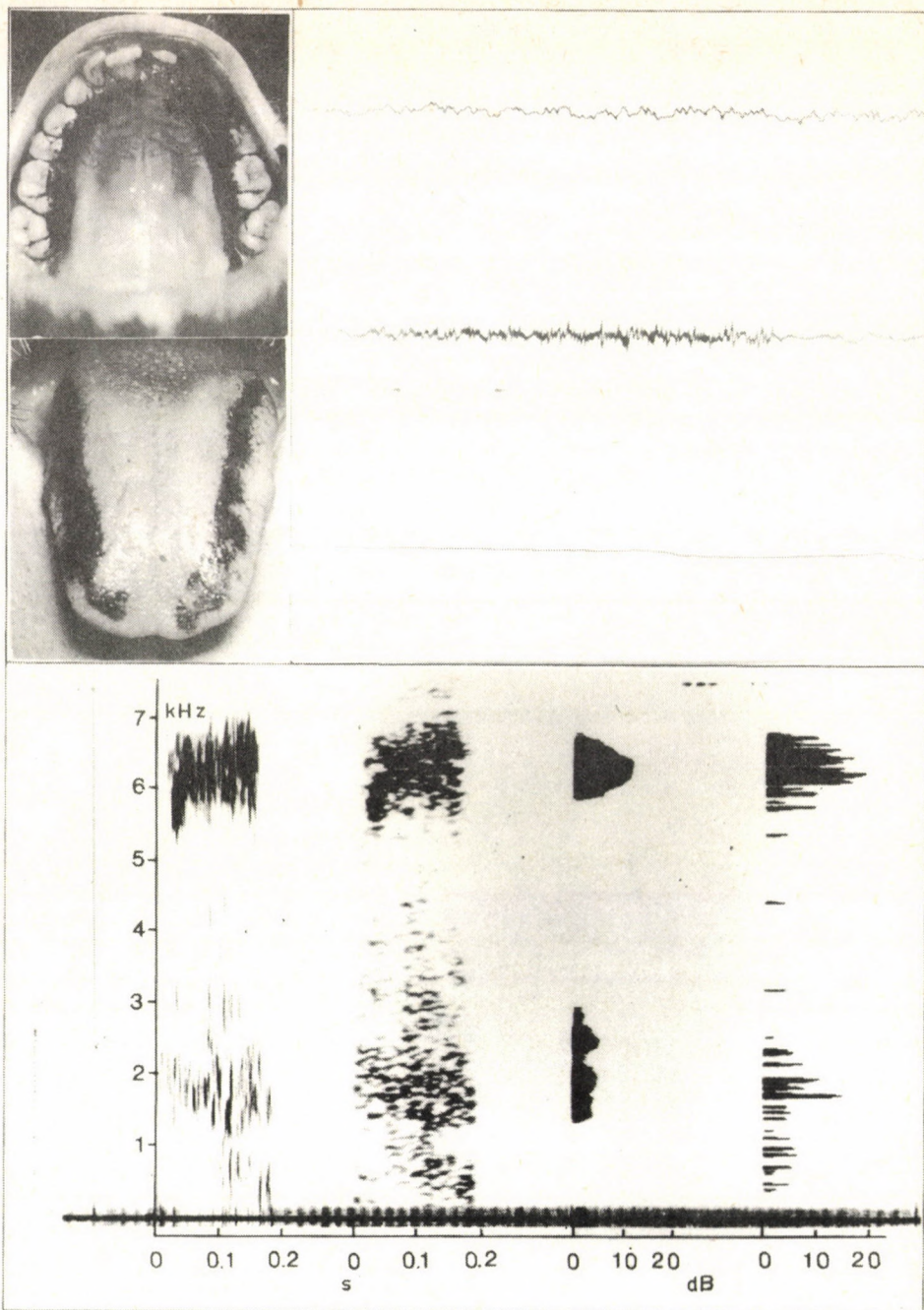
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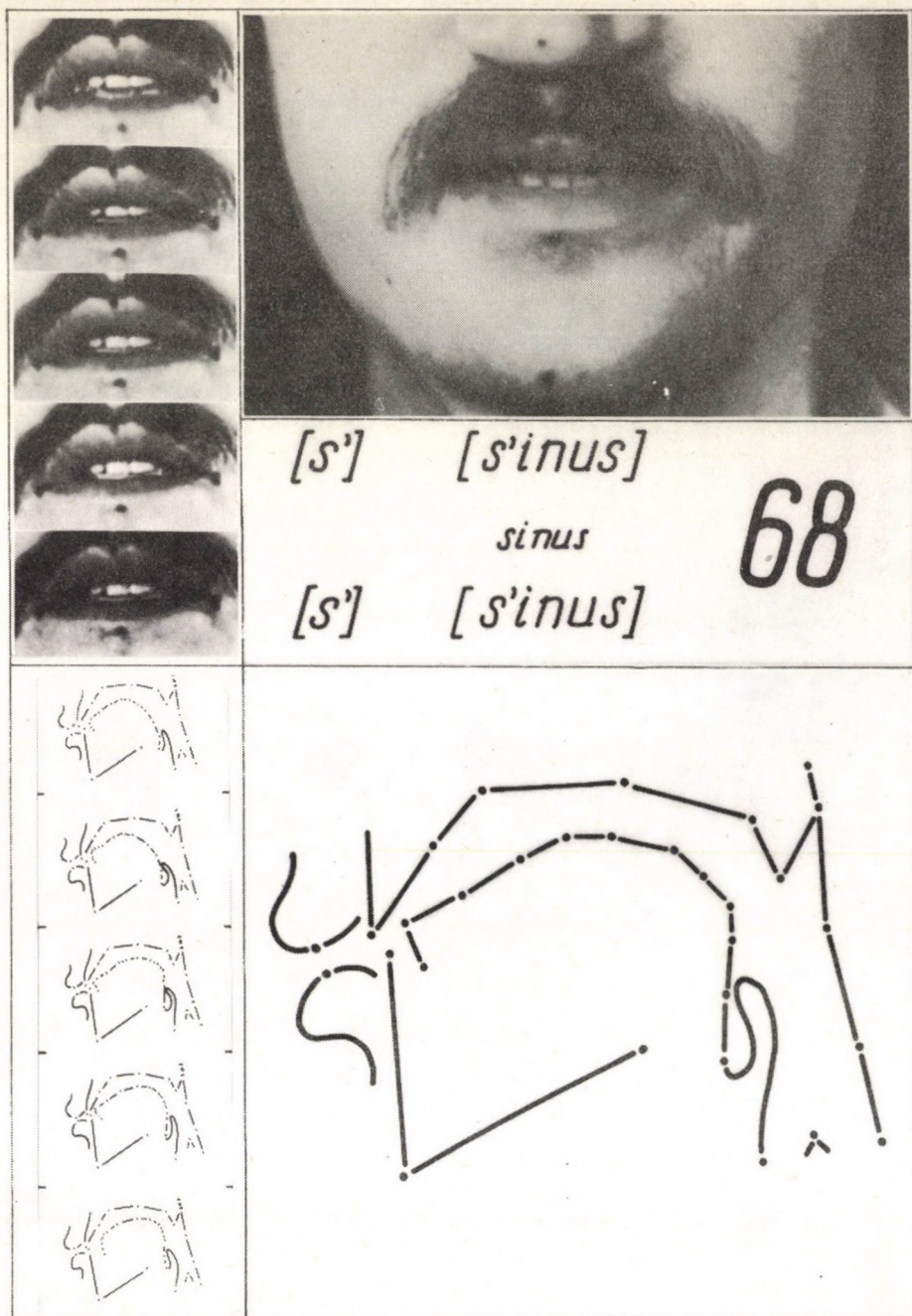
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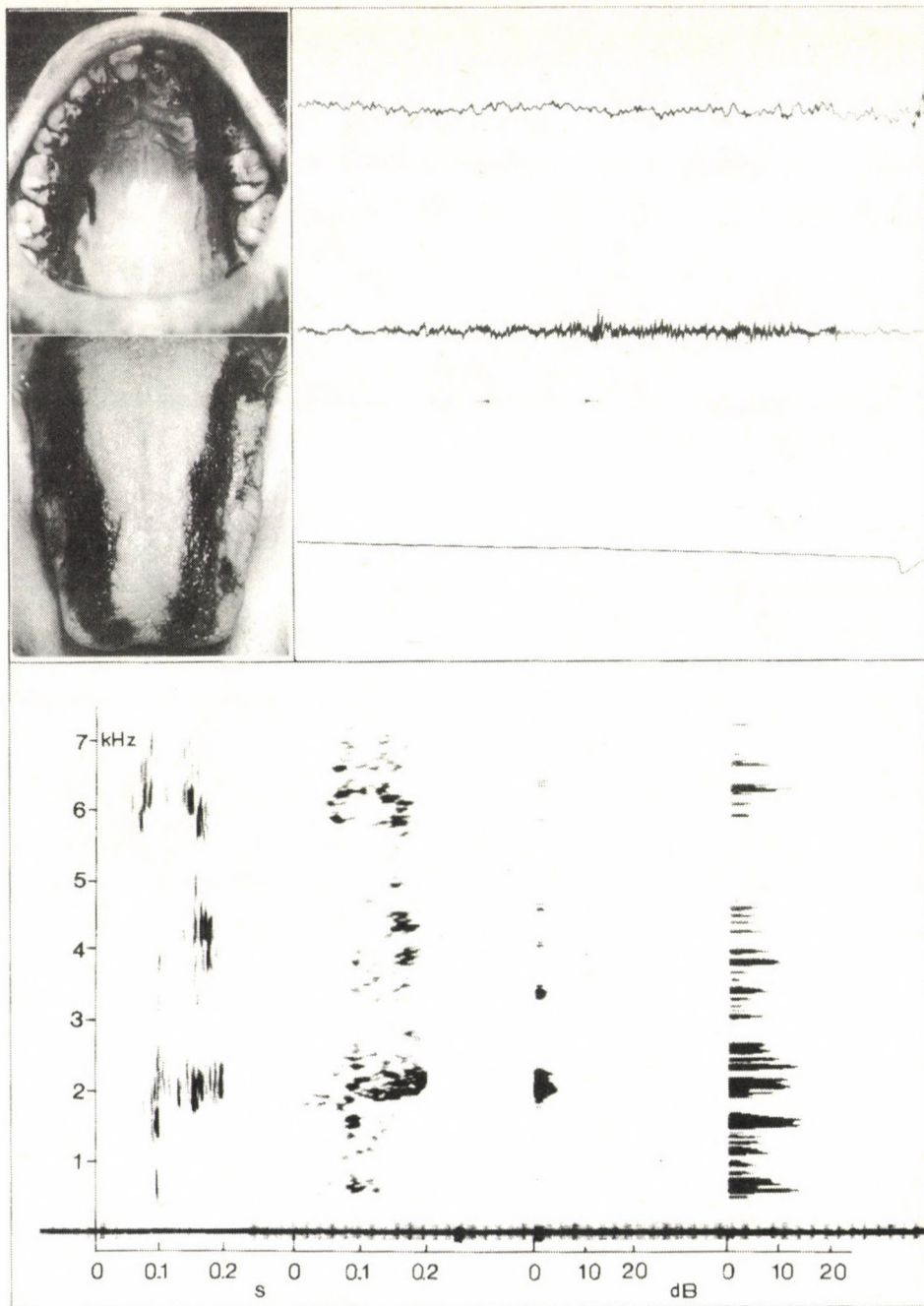


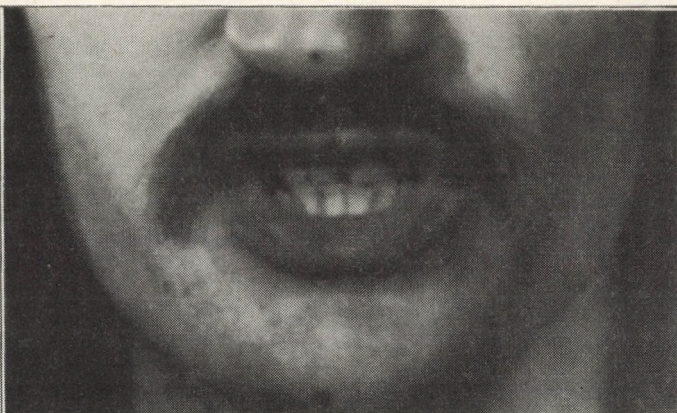
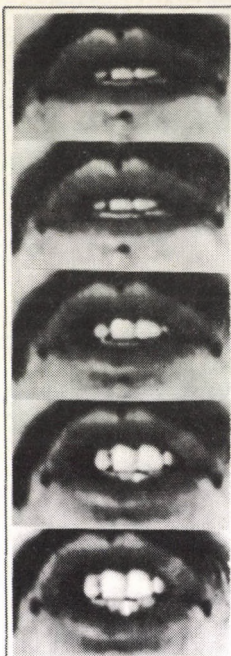


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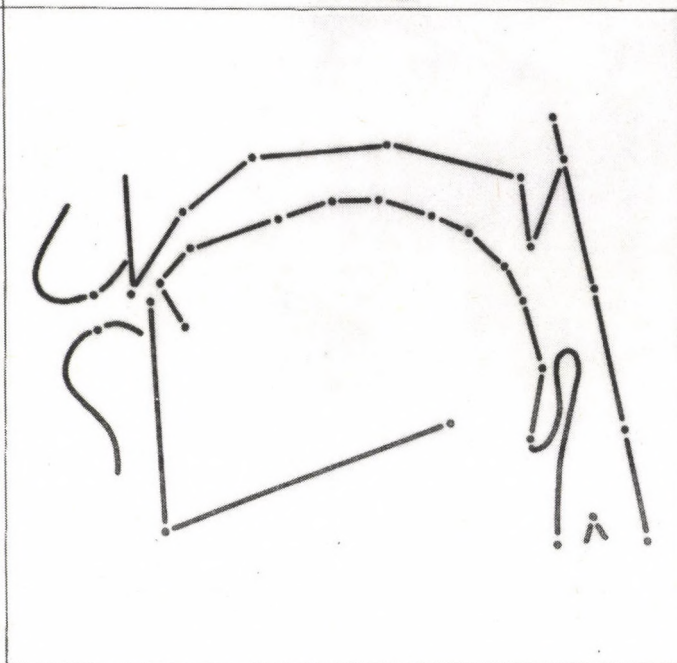
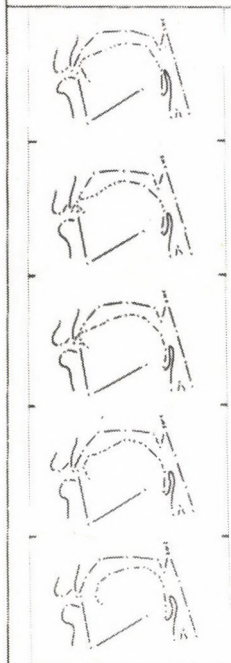


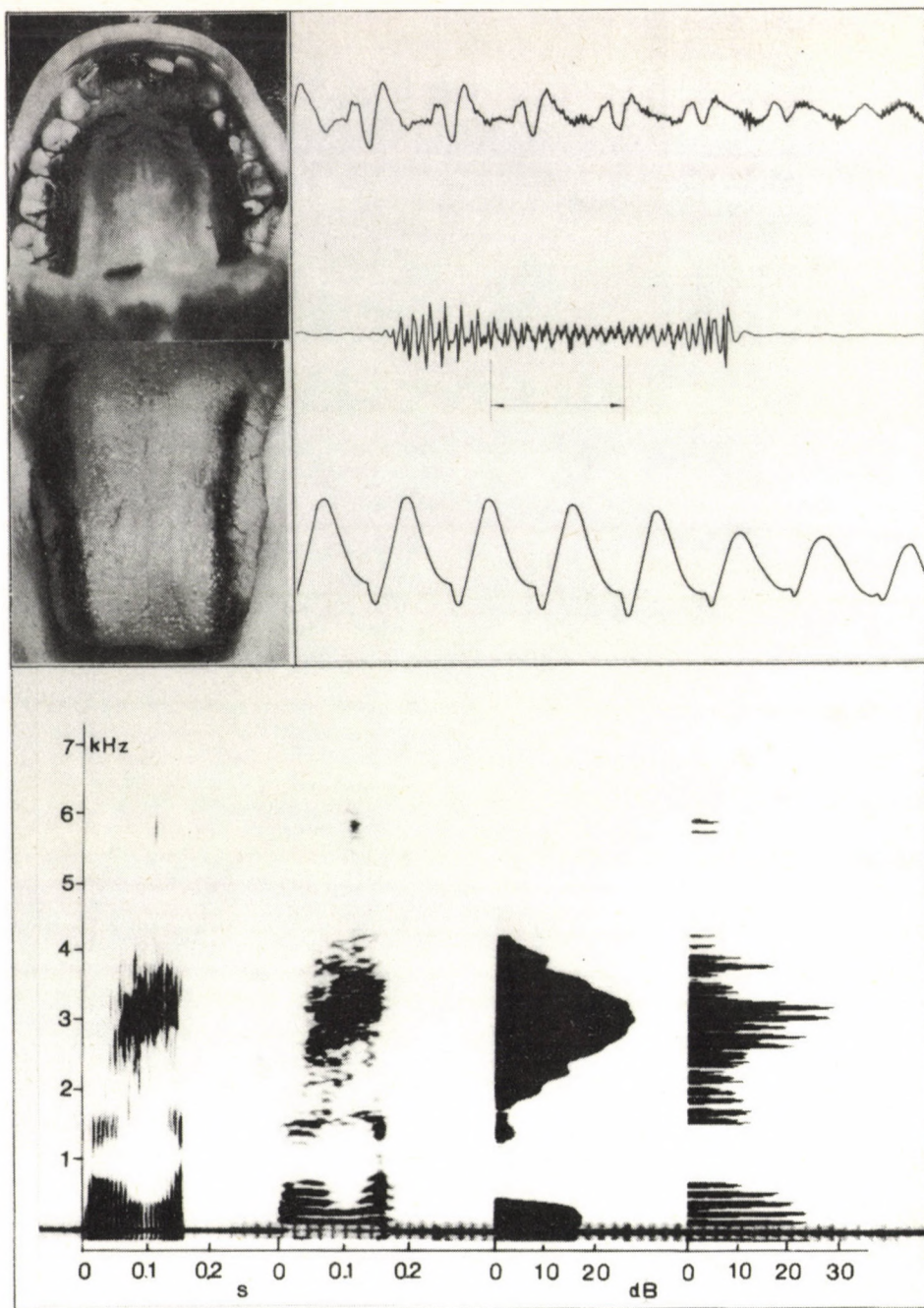
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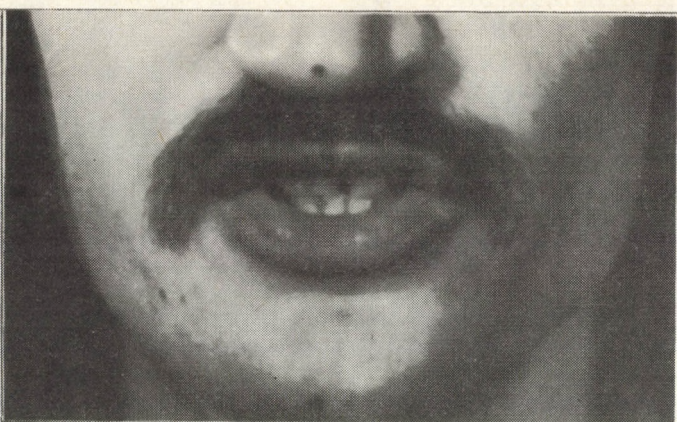
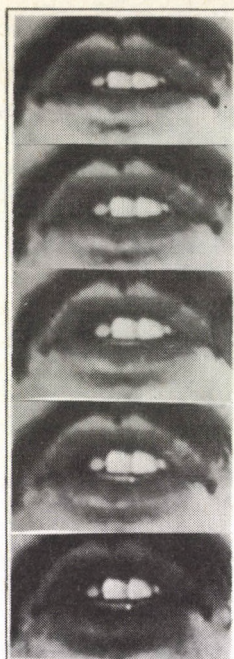
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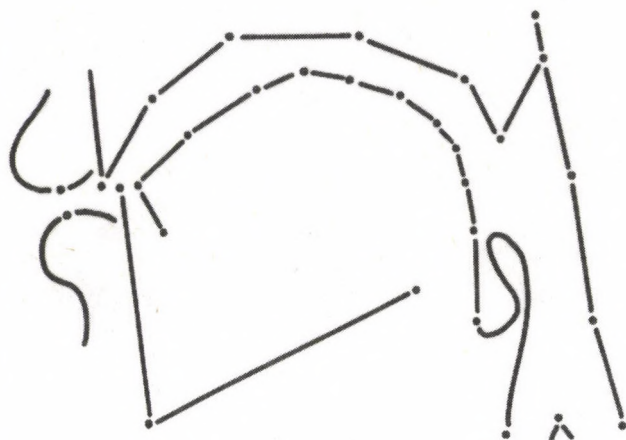


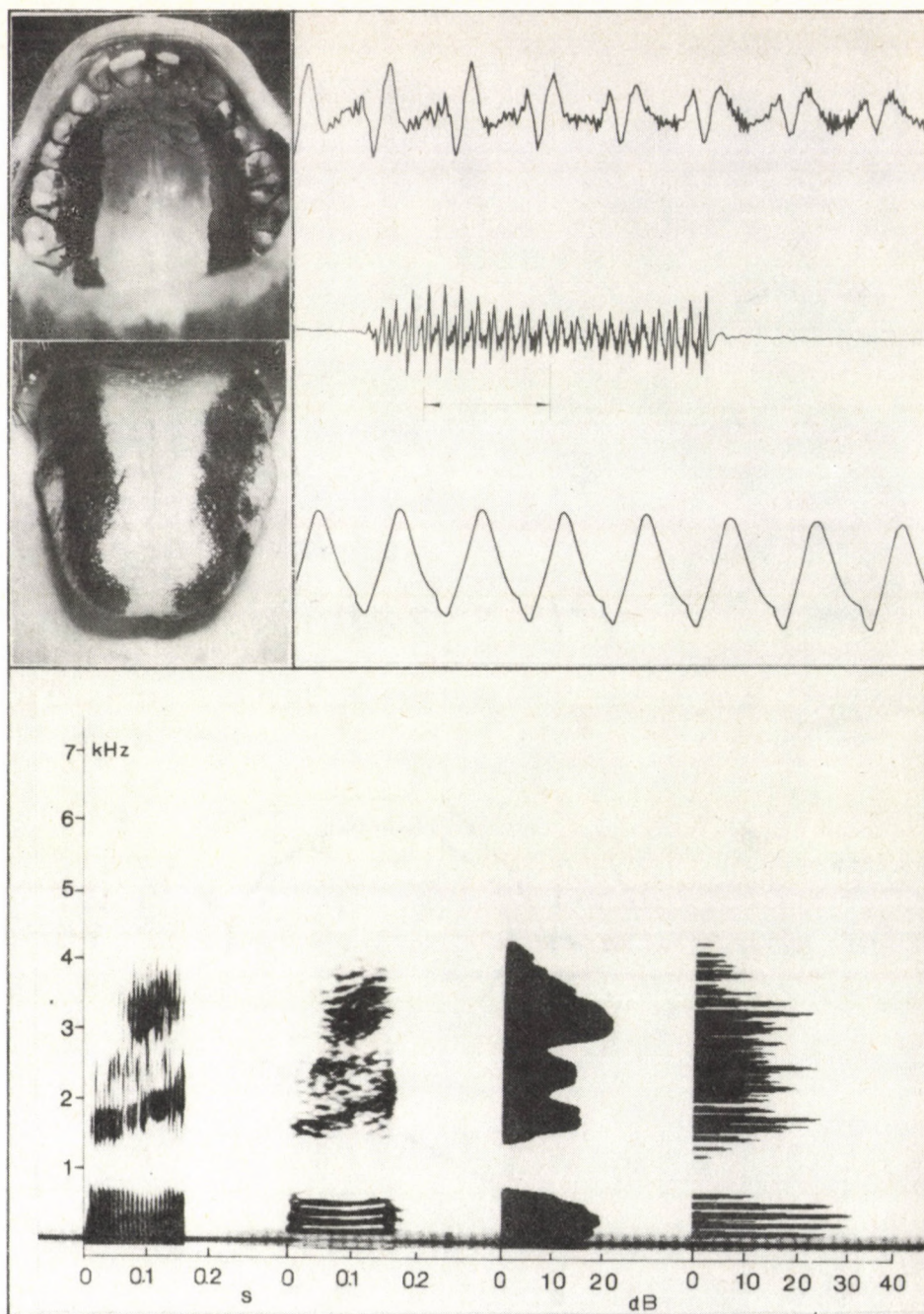
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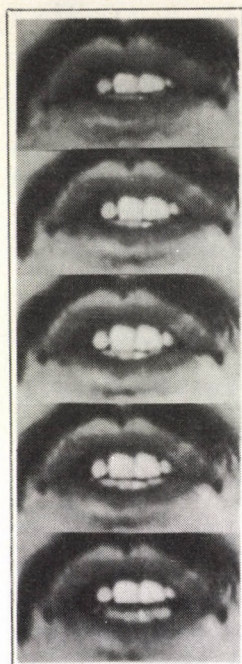
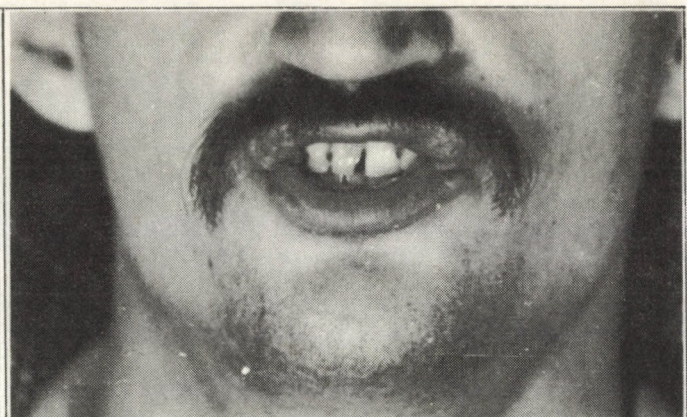
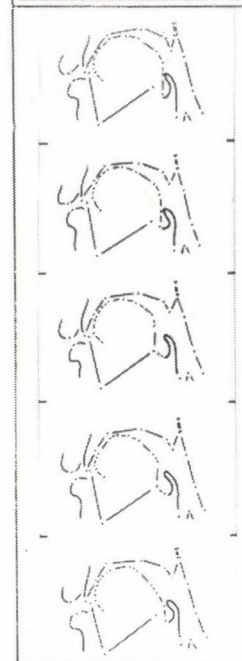
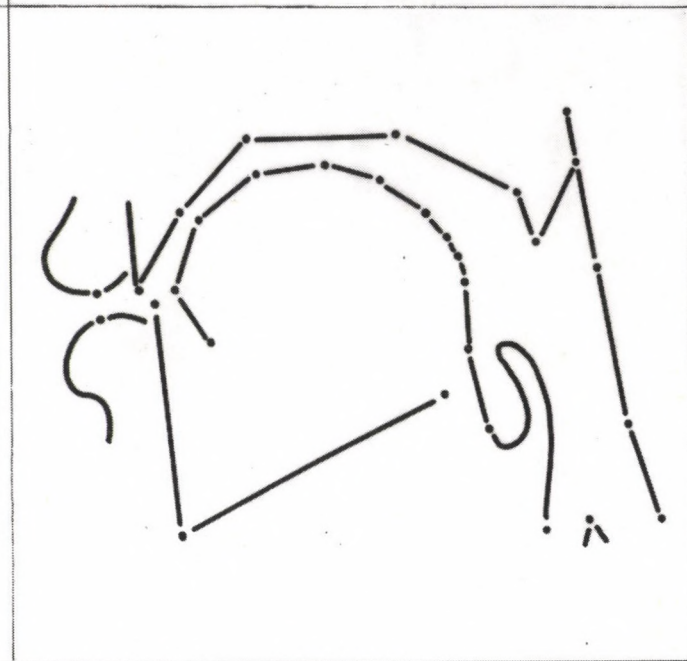
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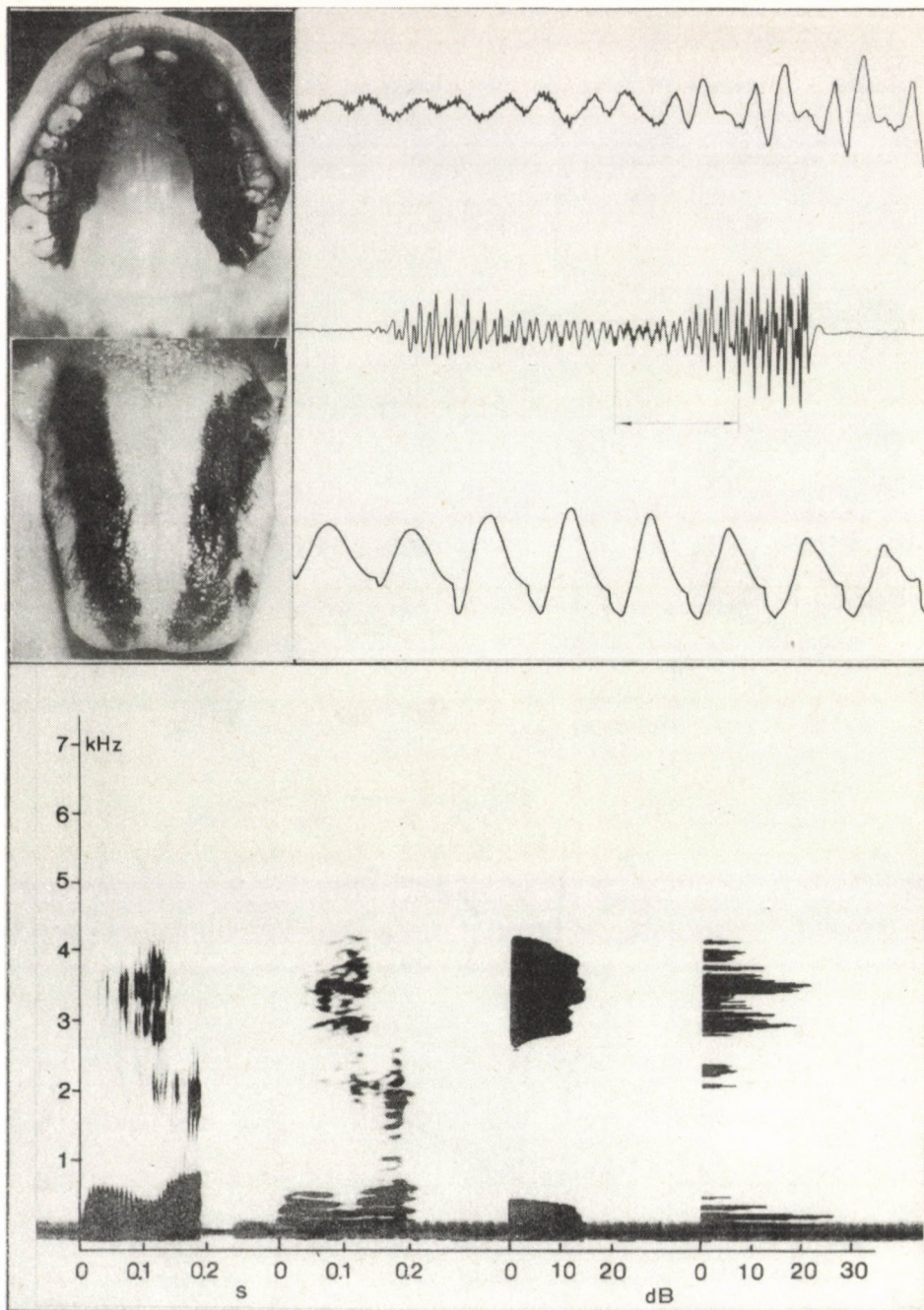
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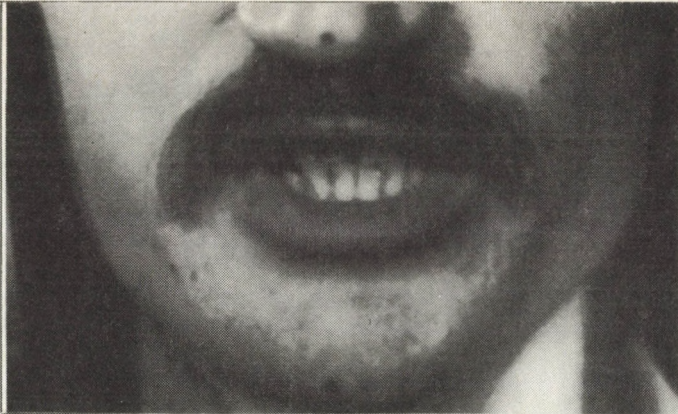
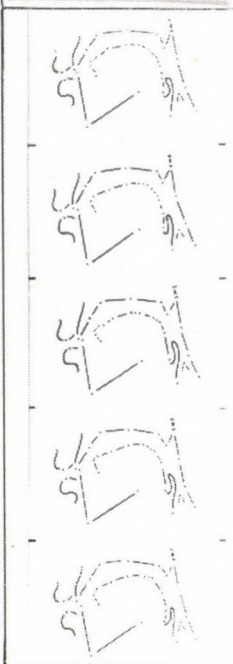
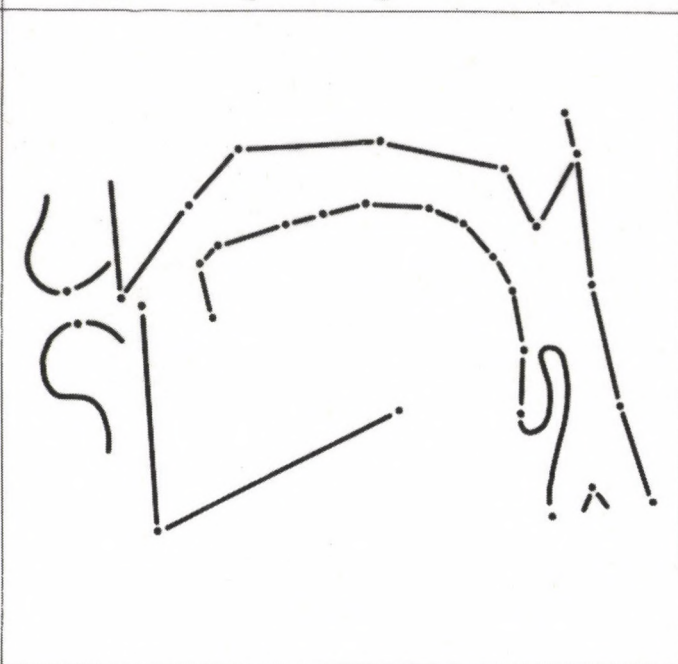
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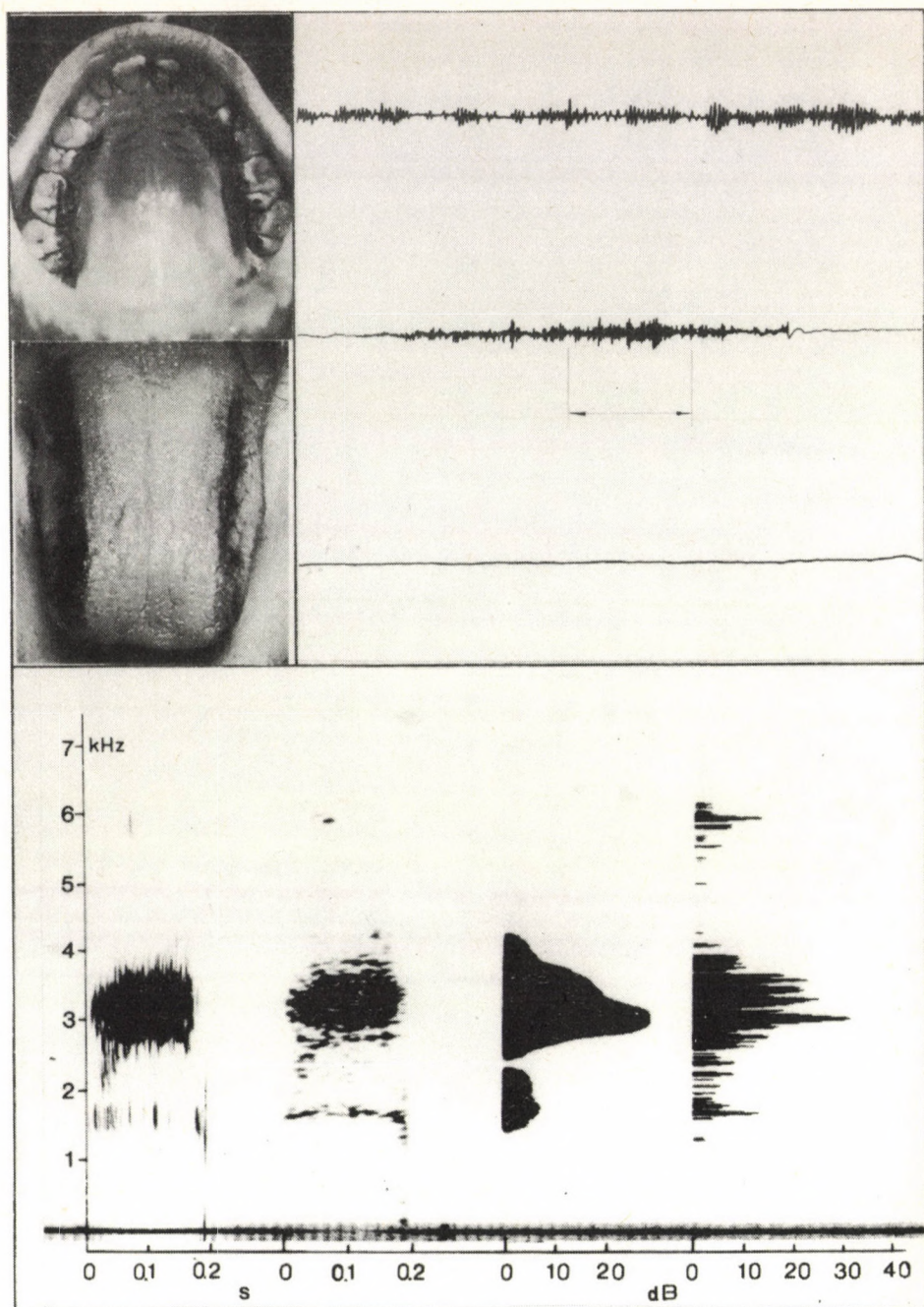


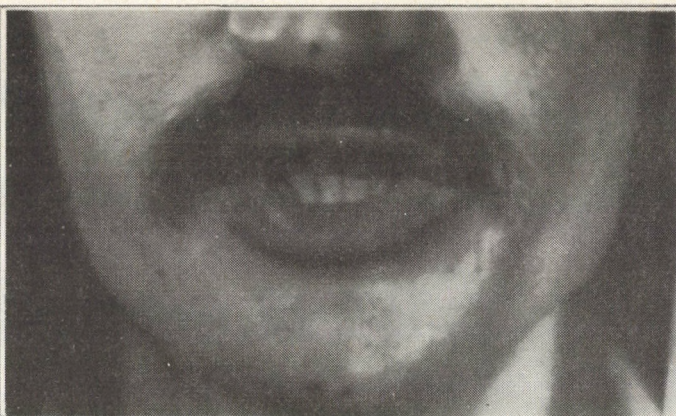
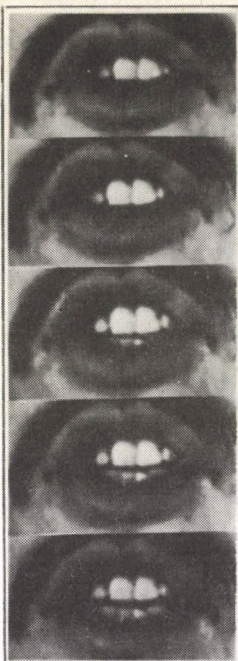


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[ʃ]	[ʃaxɪ]	72							
	<i>szachy</i>								
[š]	[šaɣy]								
									



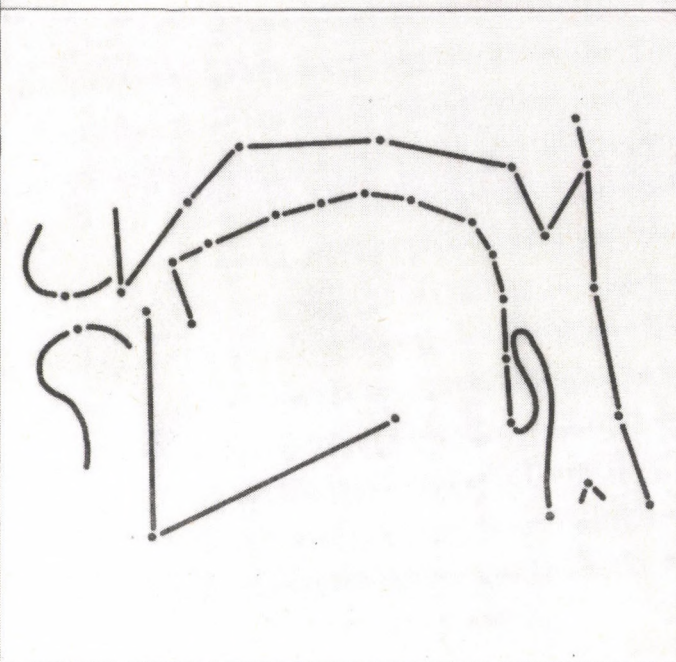
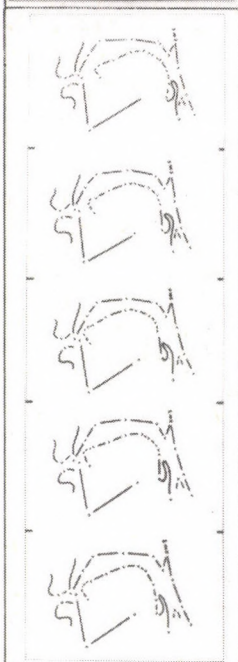


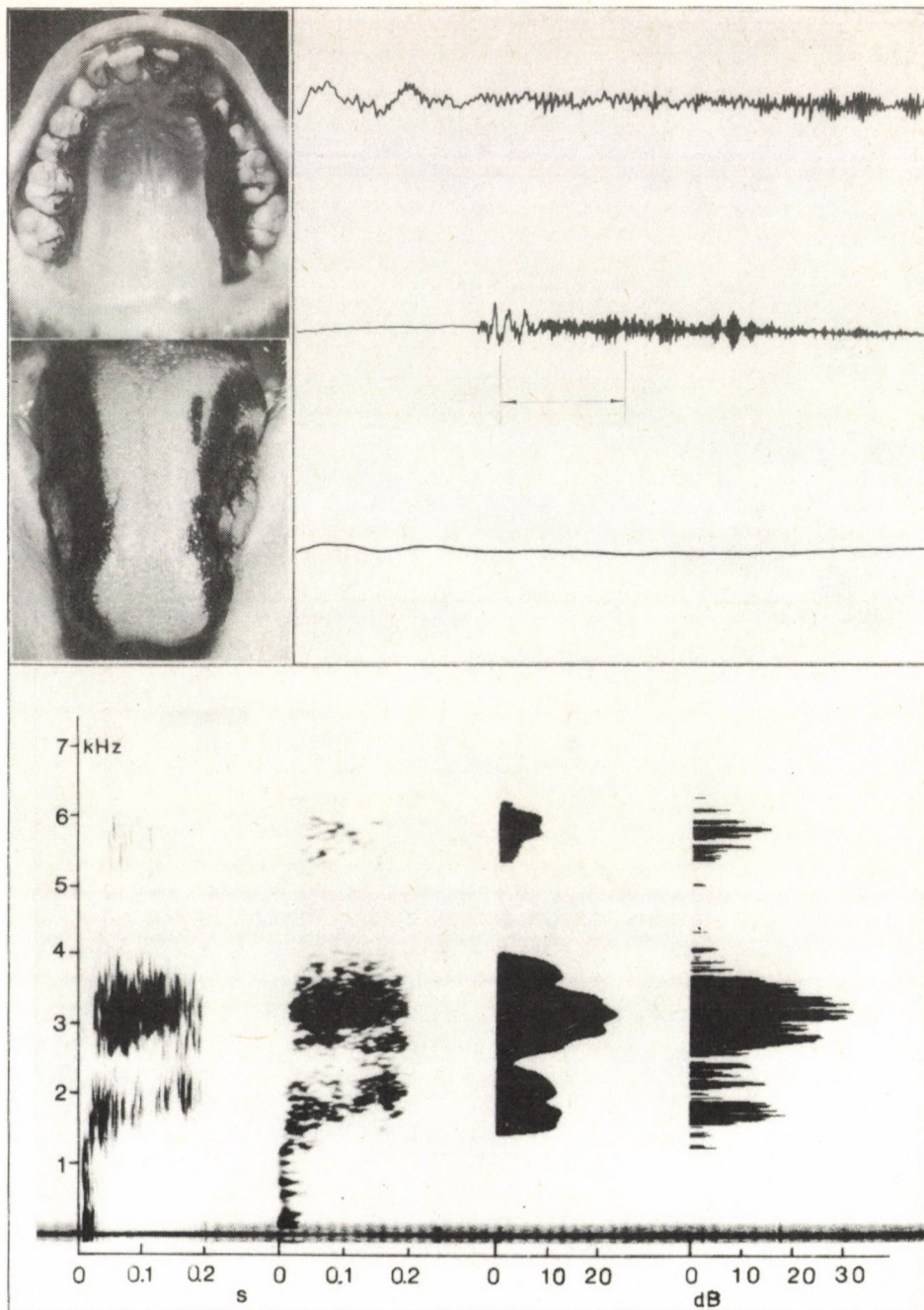
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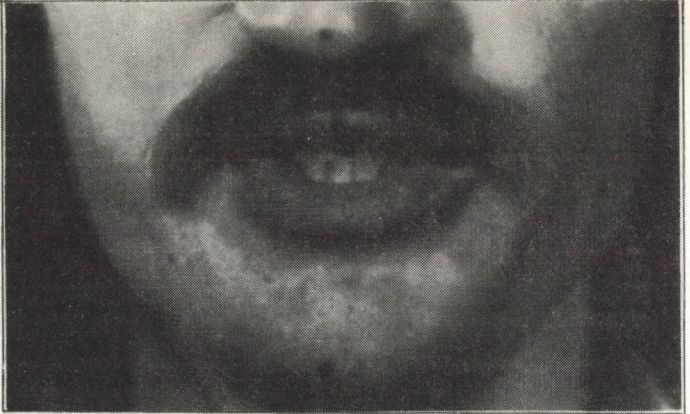
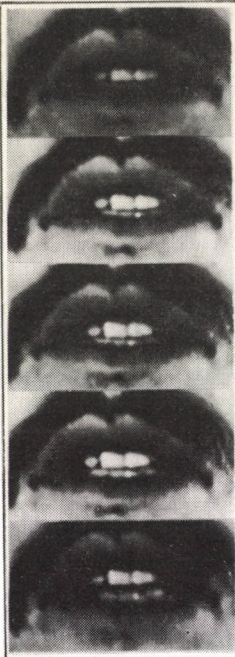
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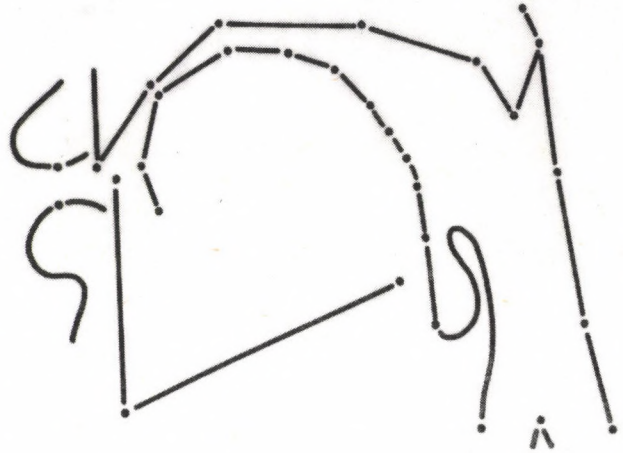
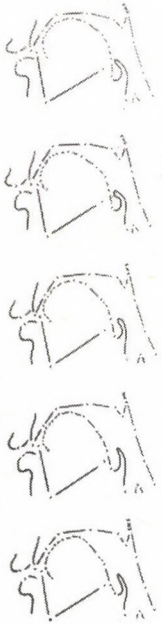


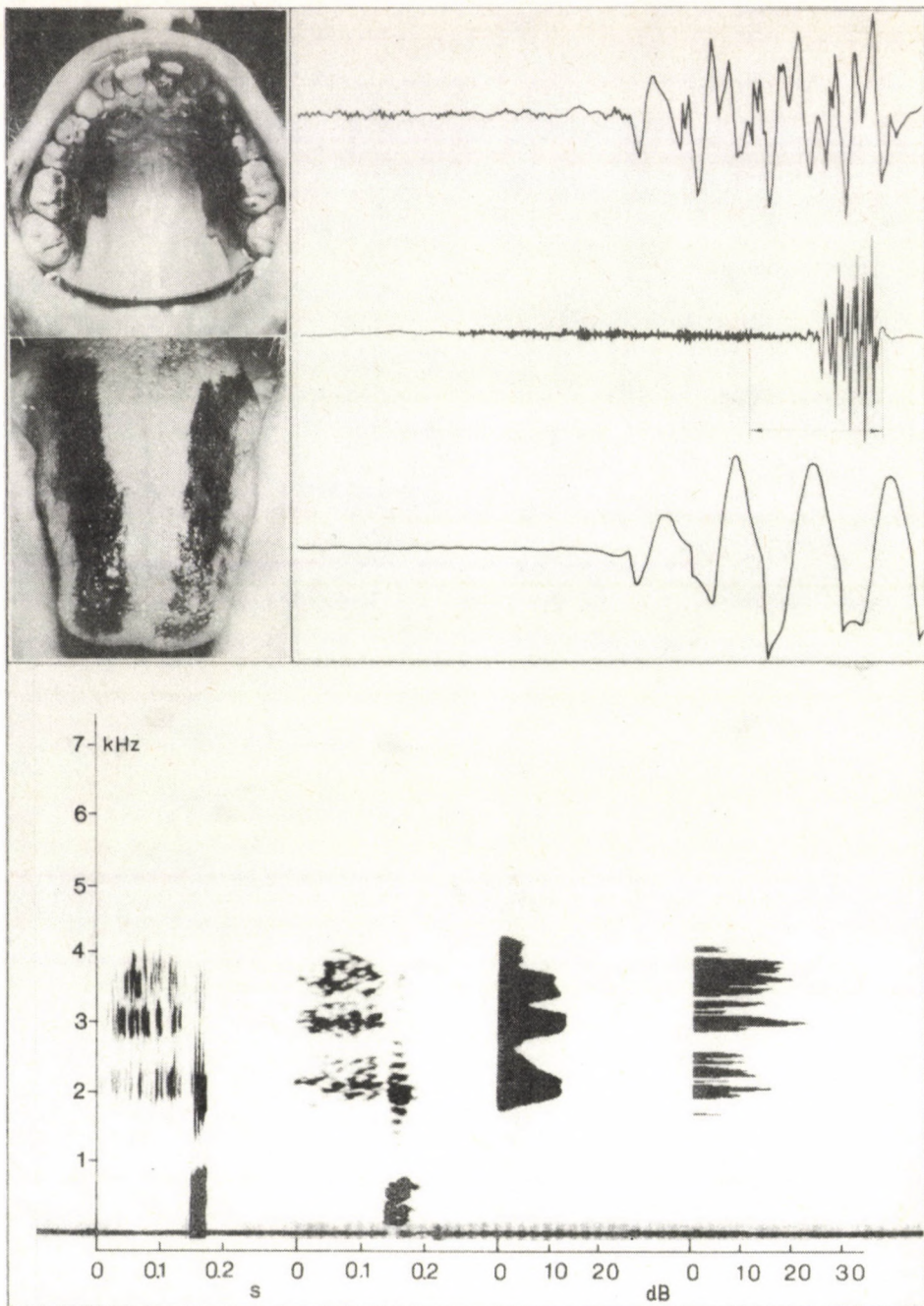
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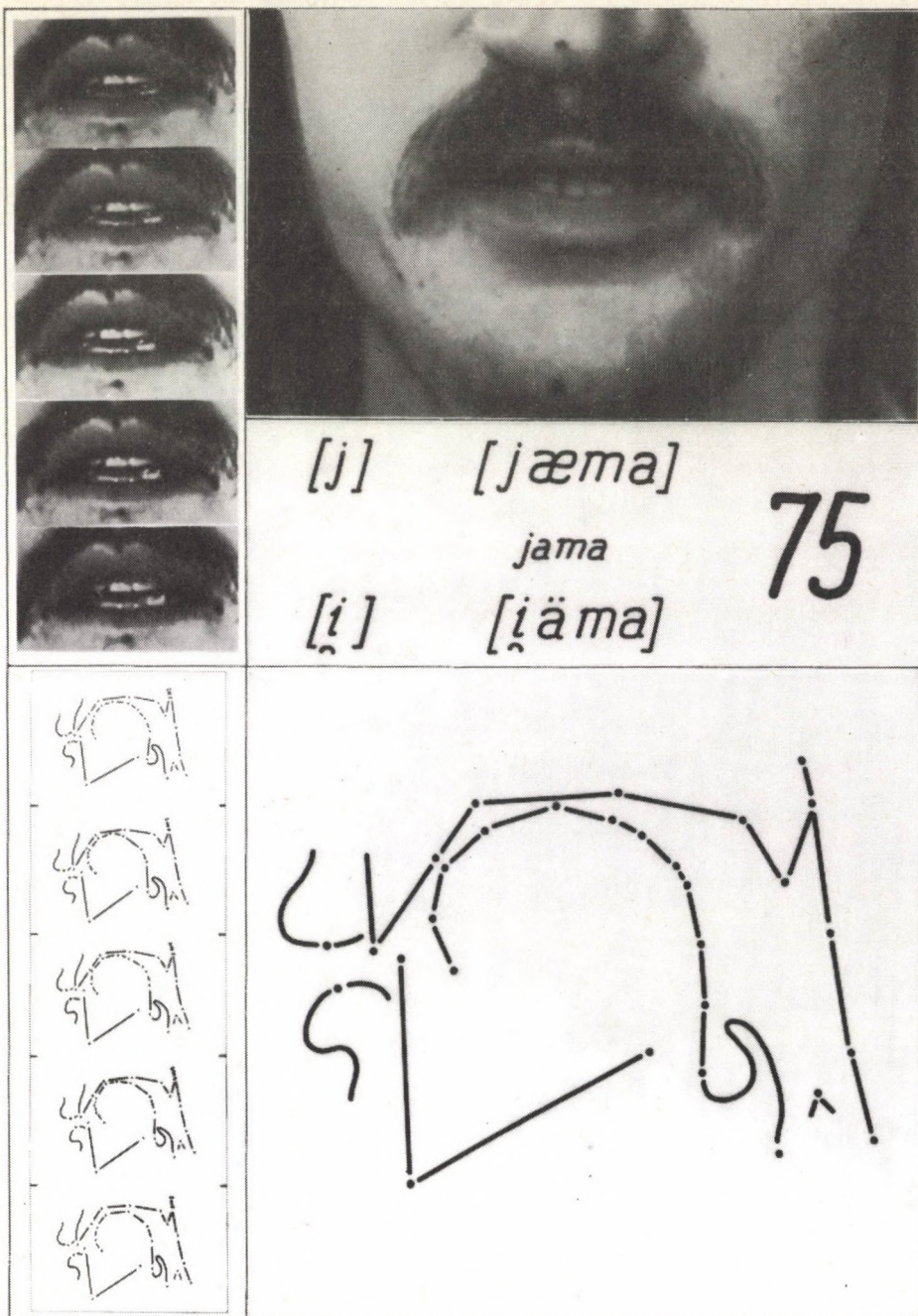
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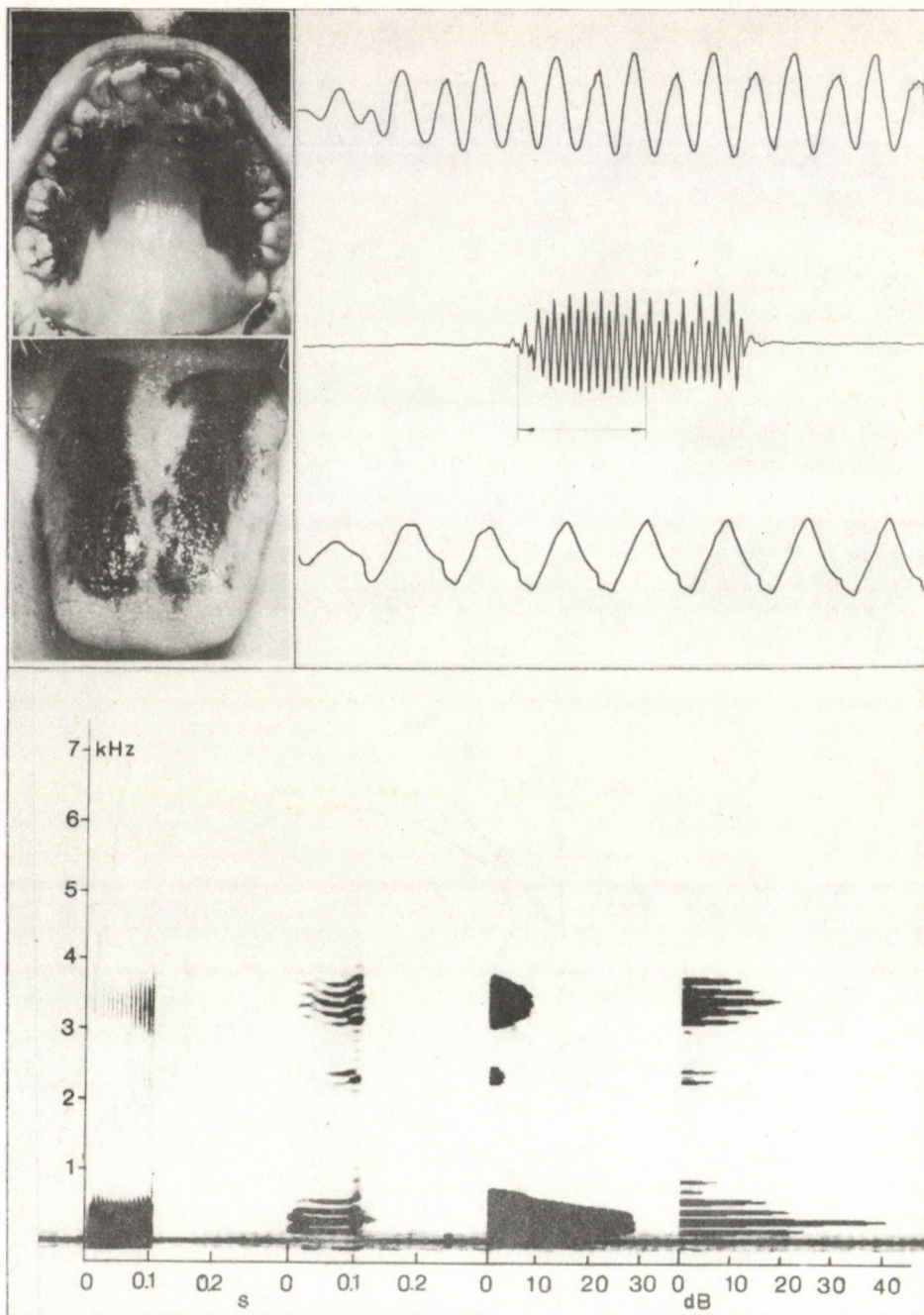
[s] [säno]

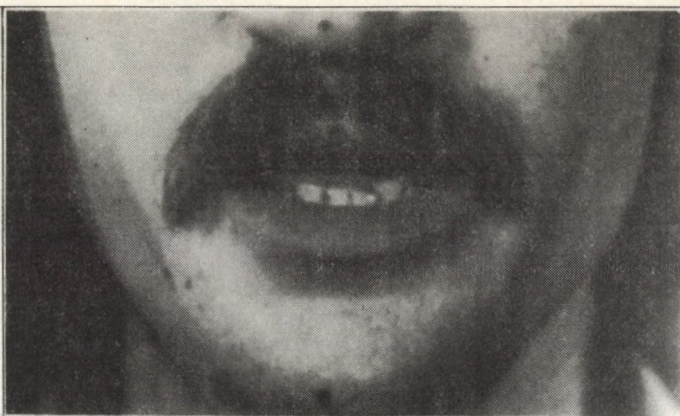
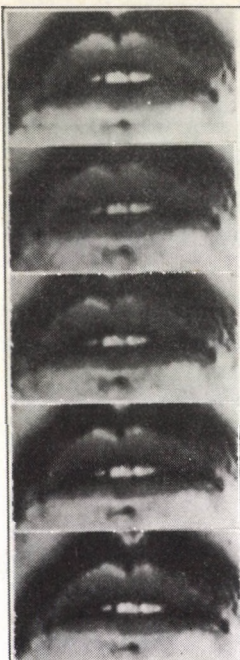
74









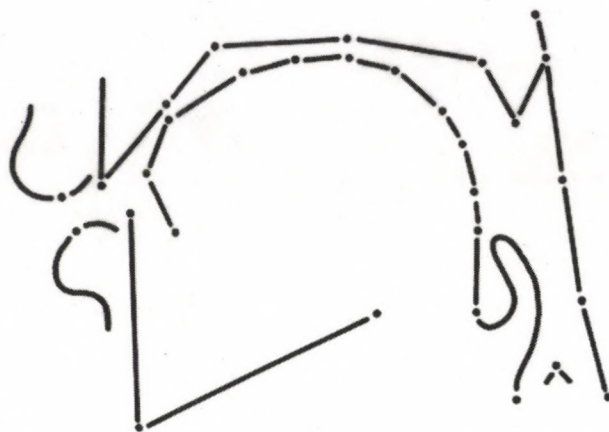
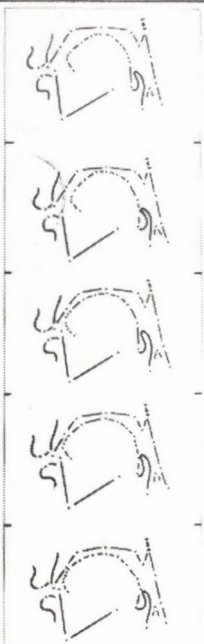


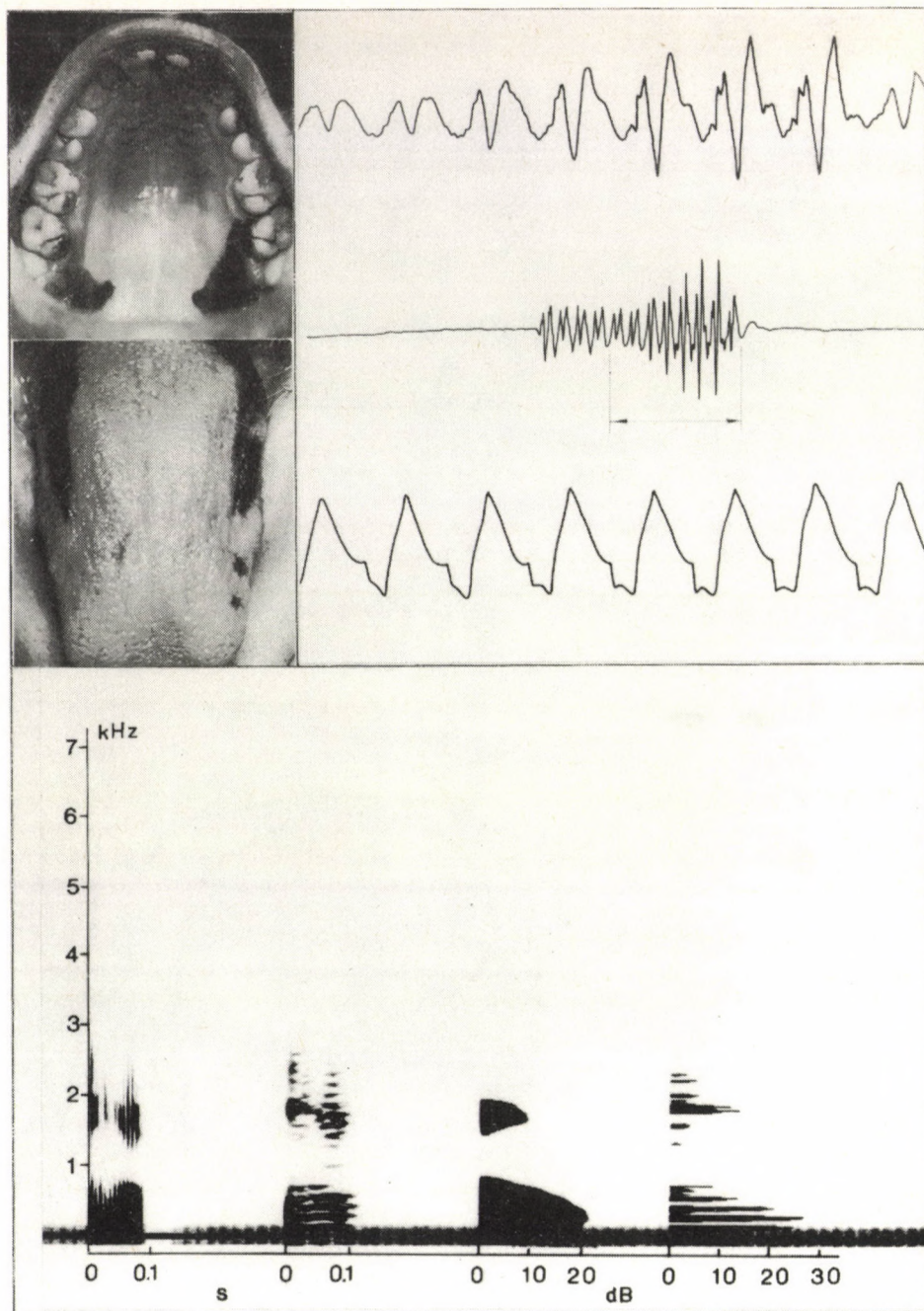
[ʃ] [kleʃda]

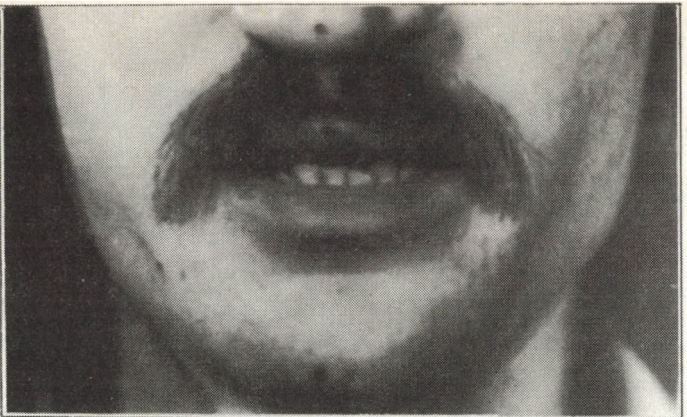
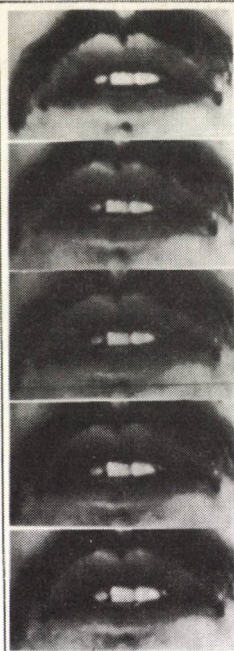
klechda

[ʃ] [kleʃda]

76





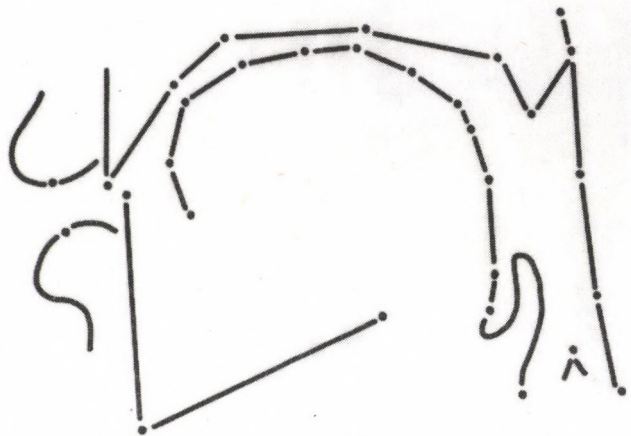
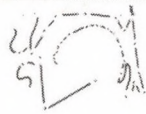


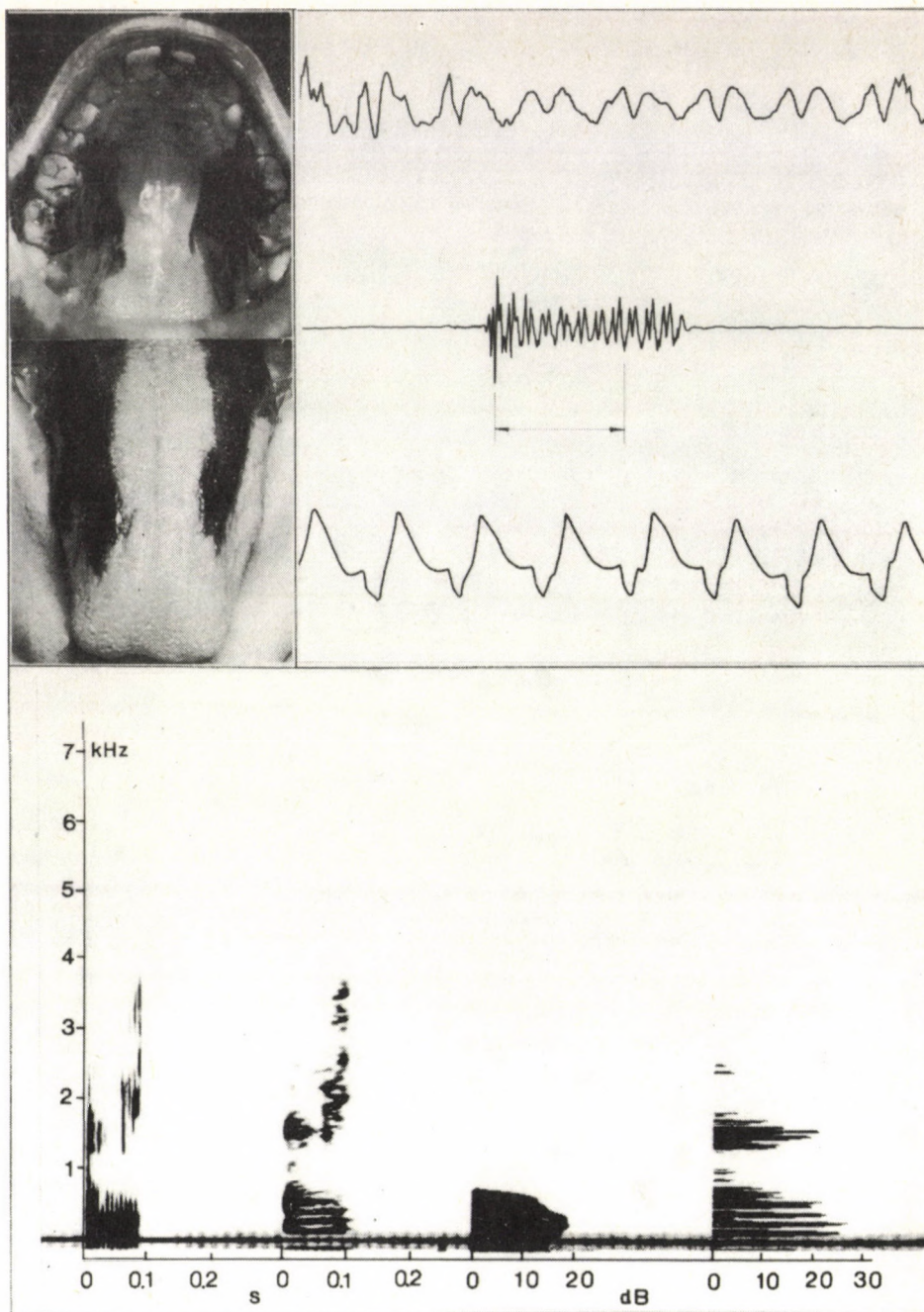
[ɖ] [daɖʑelɔɲɪ]

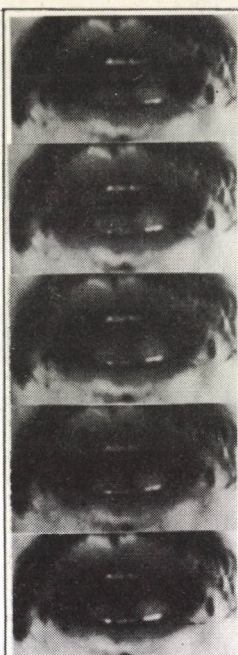
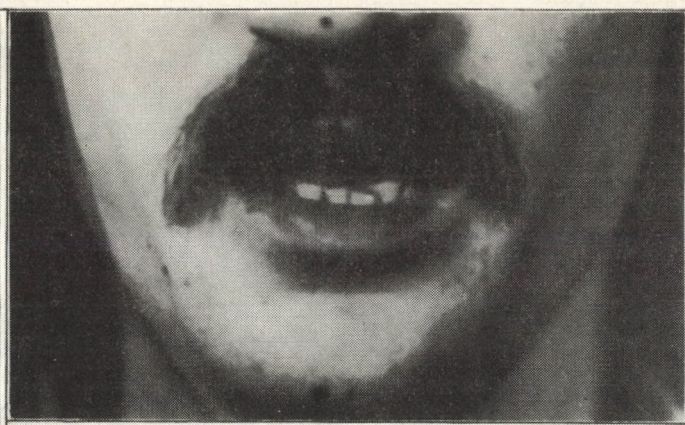
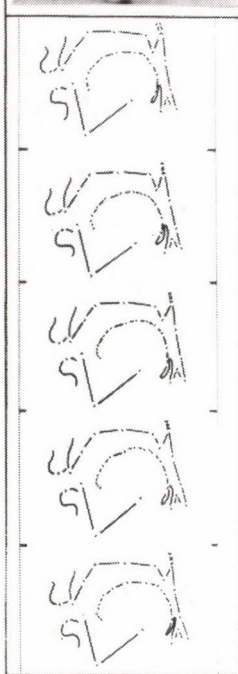
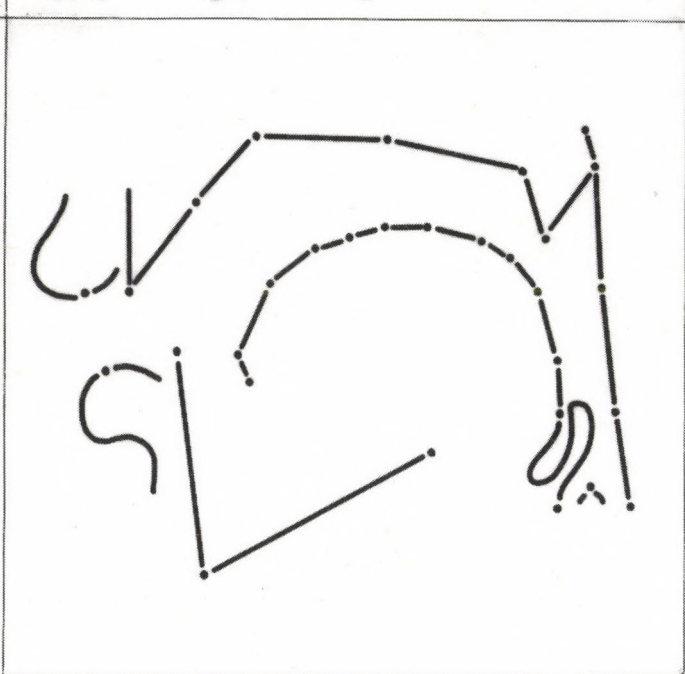
dach zielony

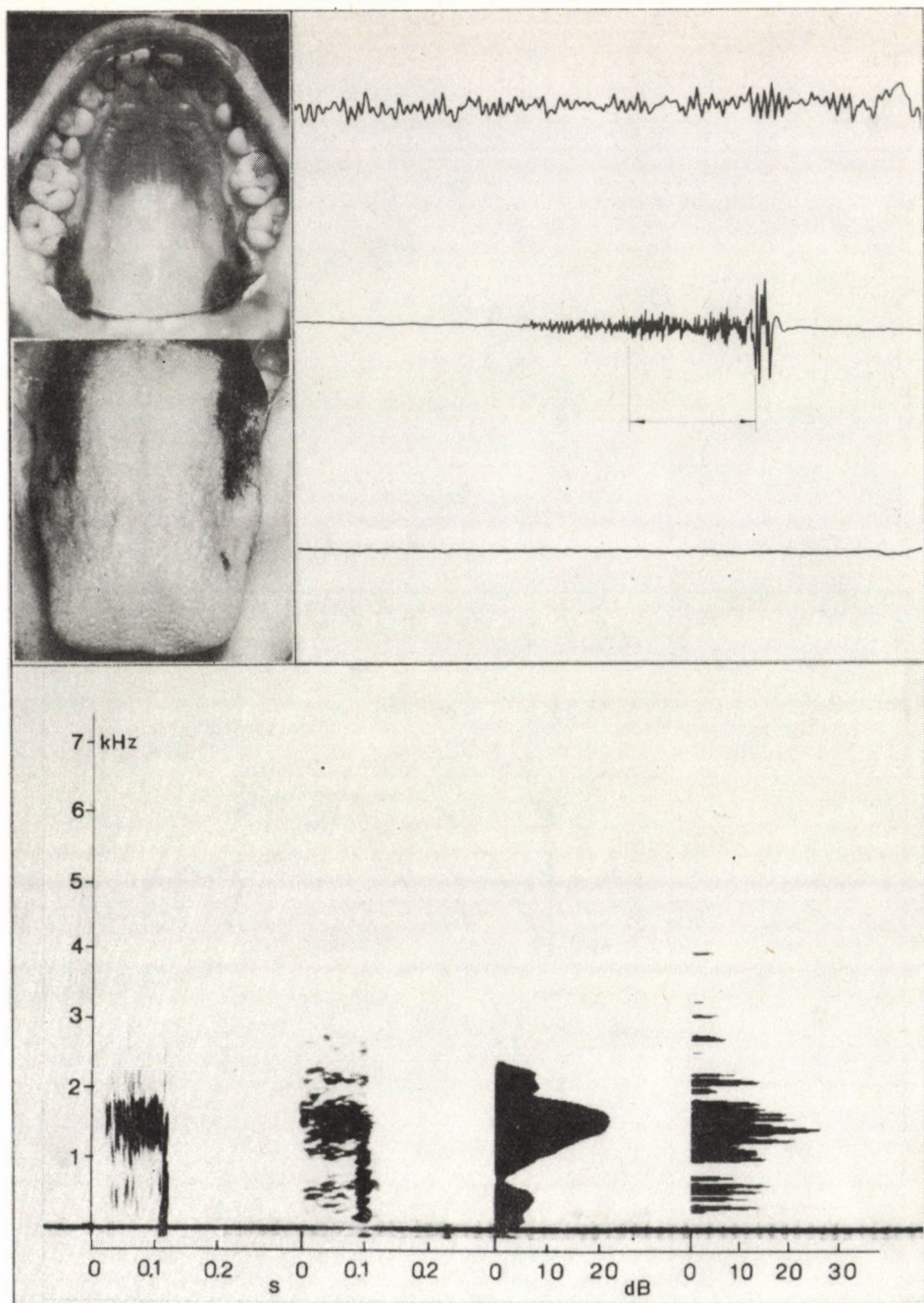
[ɖ] [daɖʑ'elɔɲɪ]

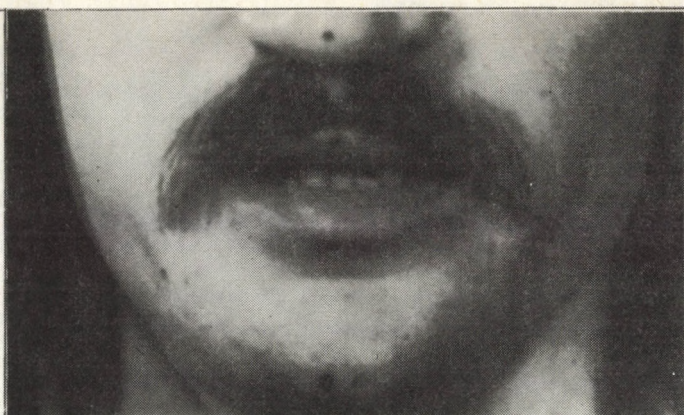
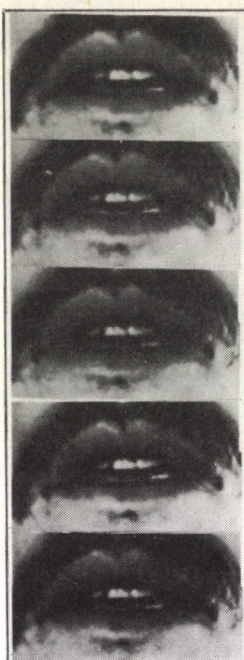
77





	
	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>[x] [xata]</p> <p>chata</p> <p>[χ] [χata]</p> </div> <div style="font-size: 2em; font-weight: bold;">78</div> </div>
	



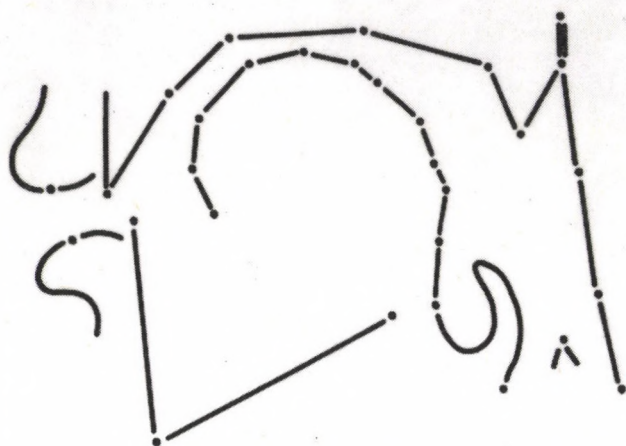
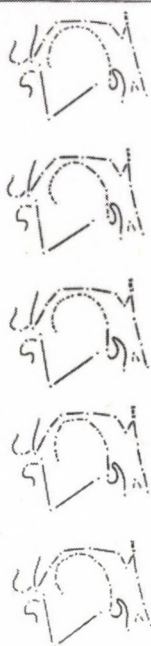


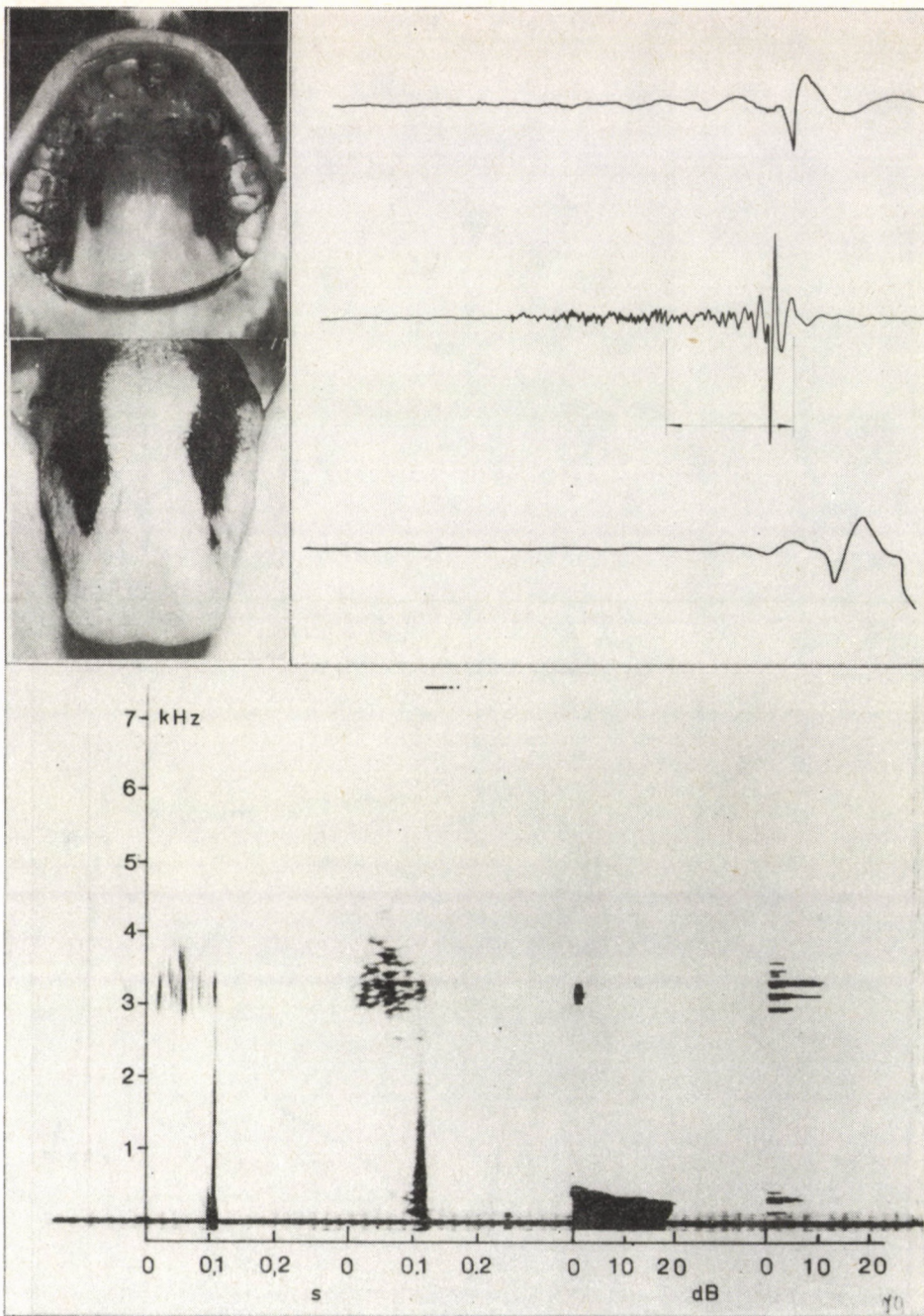
[ch] [chin's'k'i]

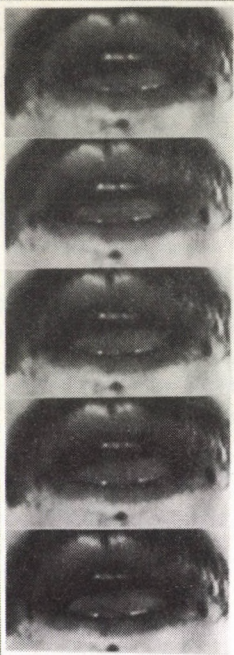
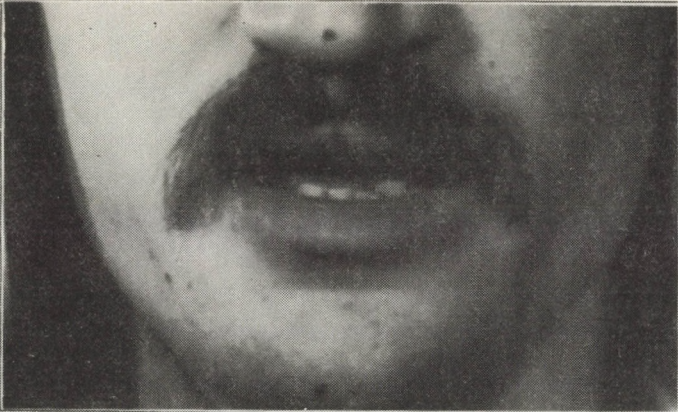
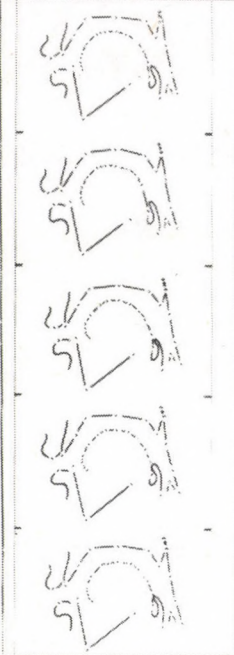
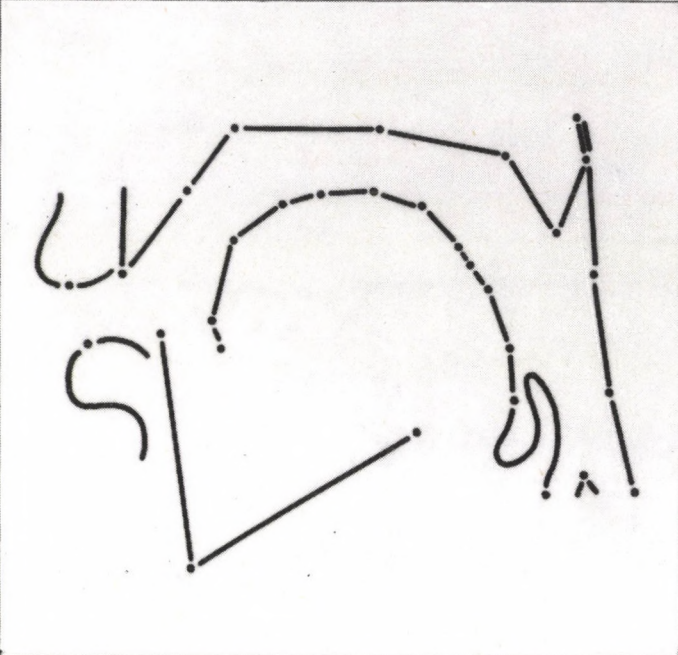
chiński

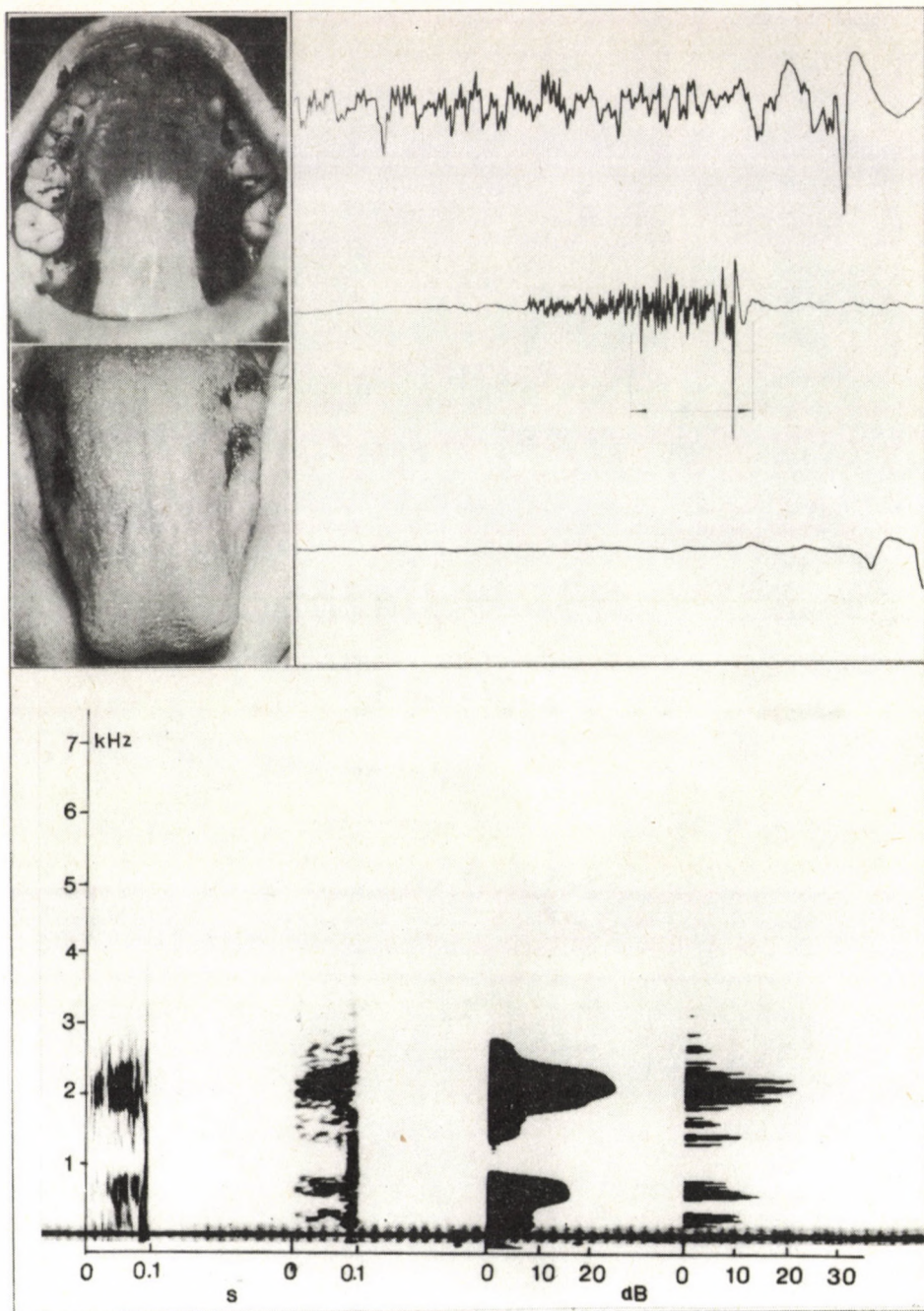
[x'] [x'ińs'k'i]

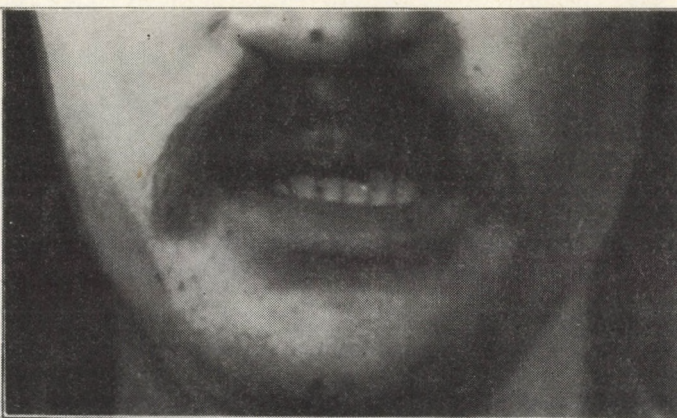
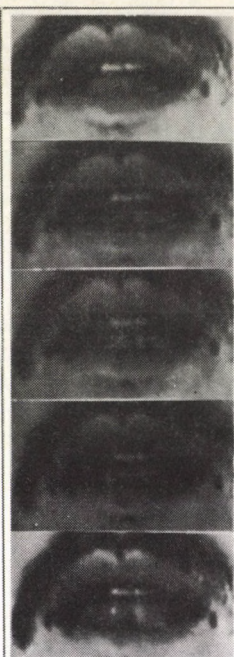
79





	
	<div style="display: flex; justify-content: space-between; align-items: center;"> <div> <p>[ch] [cheɾp]</p> <p>herb</p> <p>[x'] [x'eɾp]</p> </div> <div style="font-size: 2em; font-weight: bold;">80</div> </div>
	





[l]

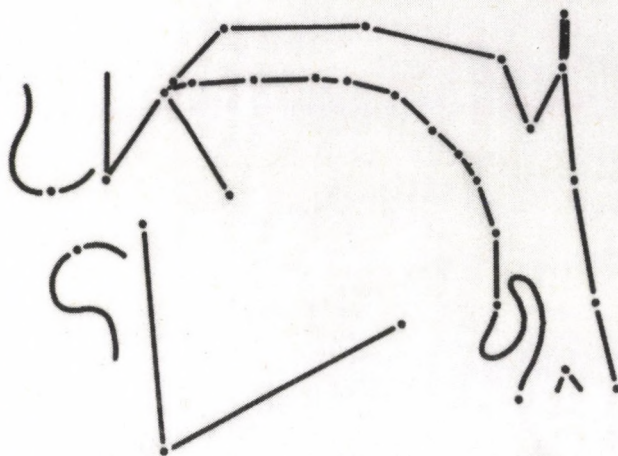
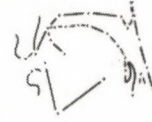
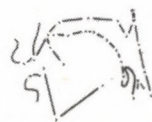
[lato]

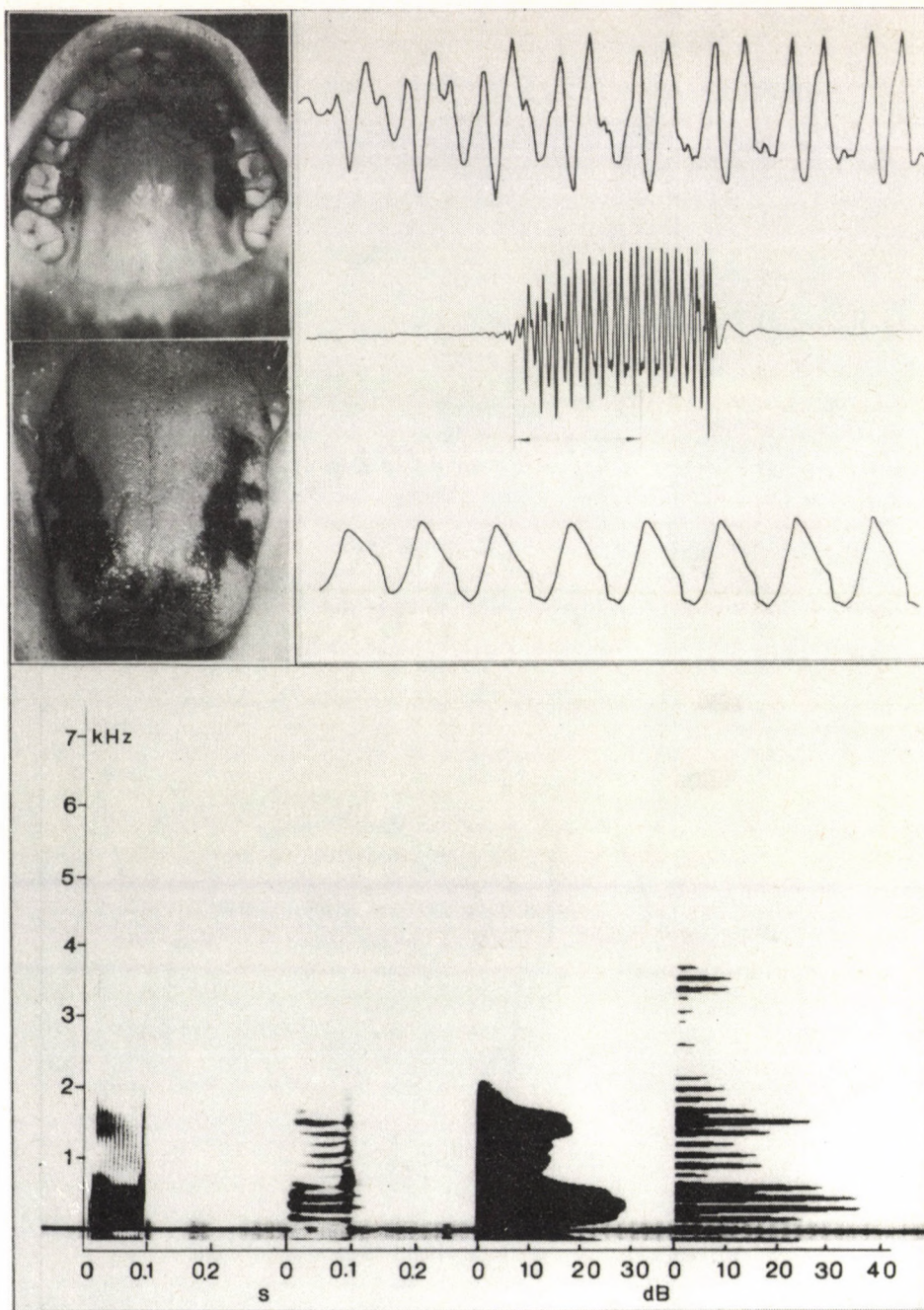
lato

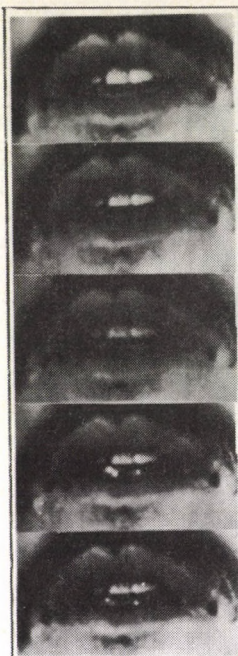
[l']

[lato]

81







[l̥]

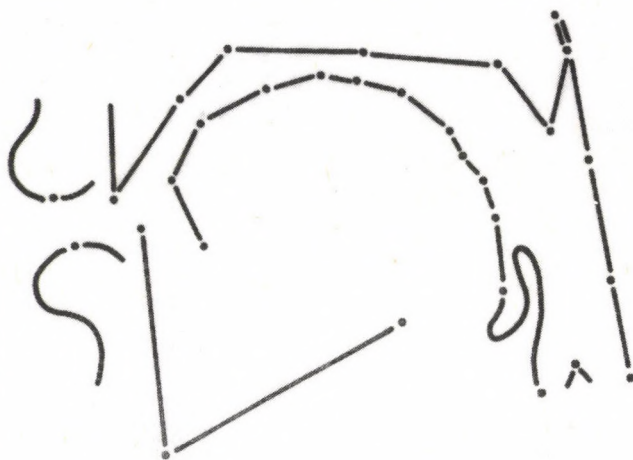
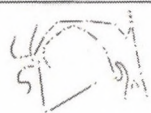
[m̥t̥l̥]

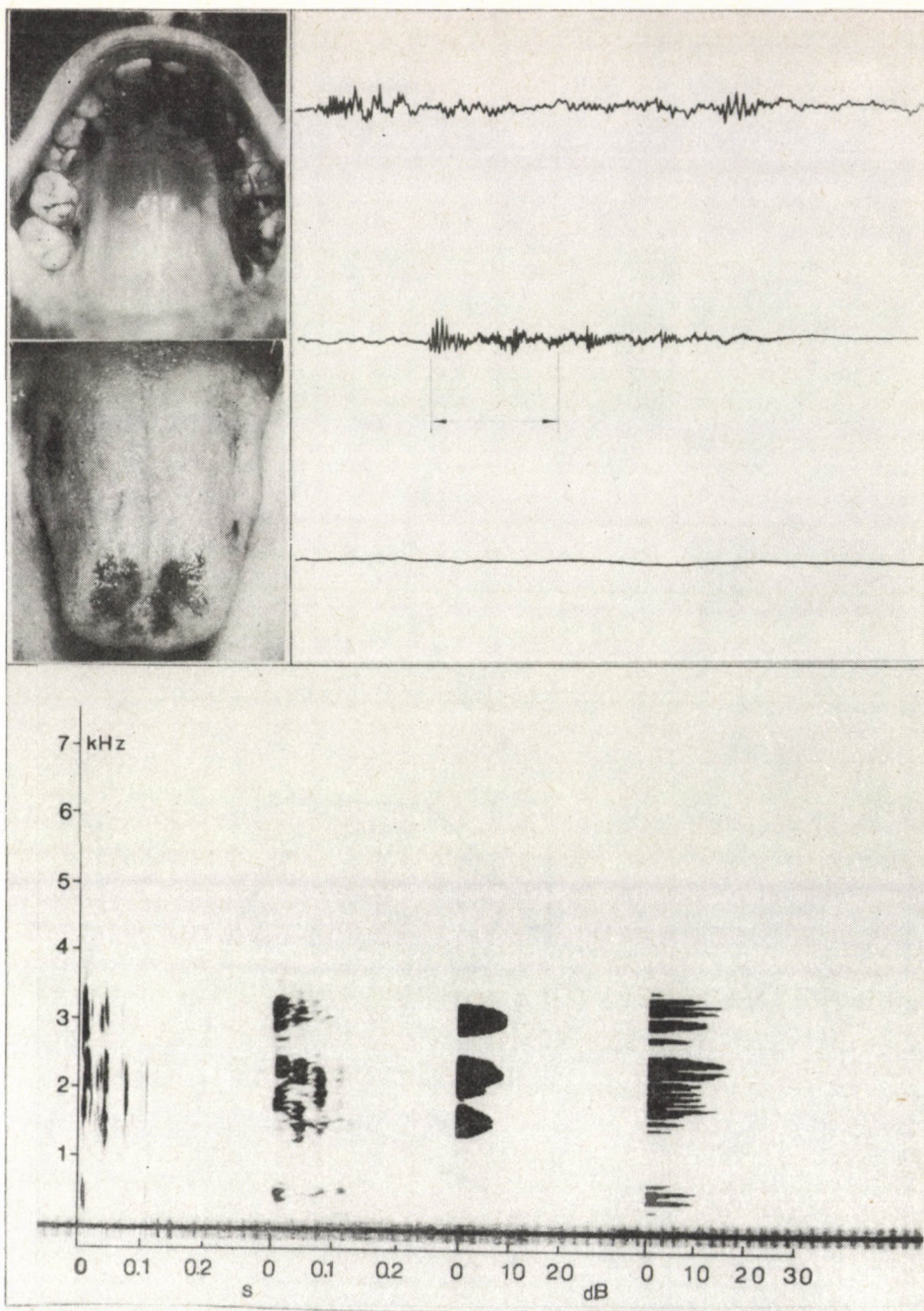
myśl

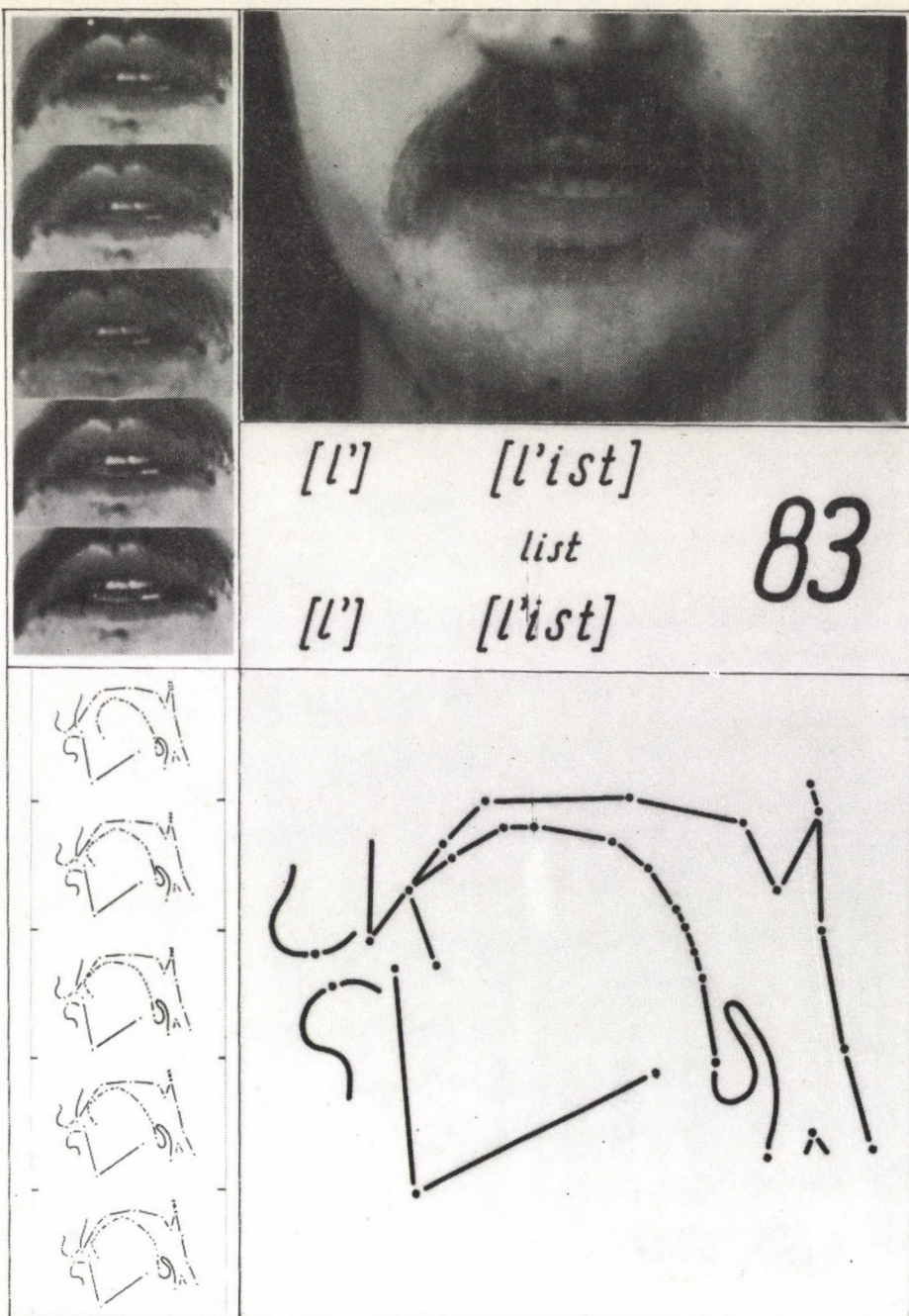
82

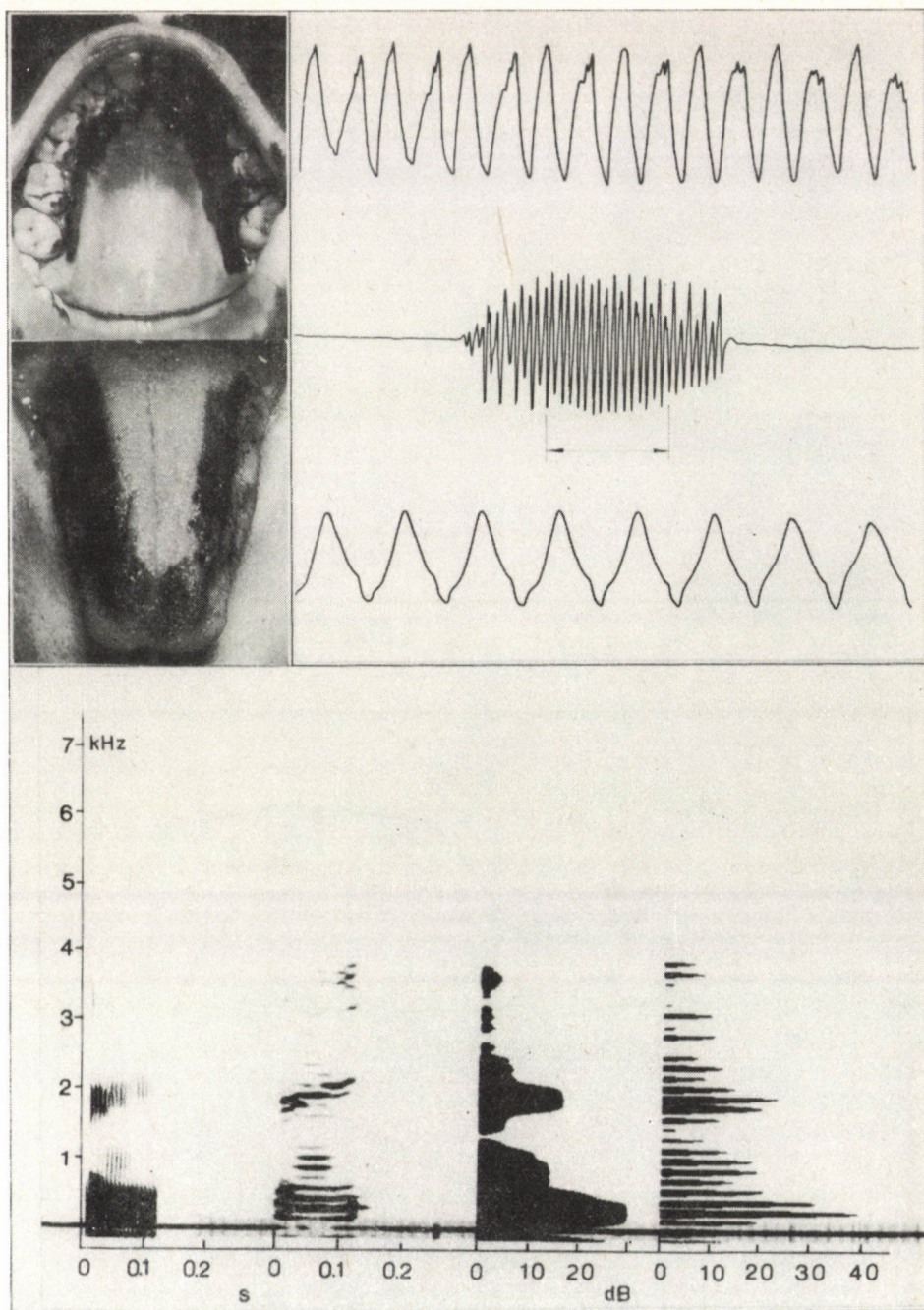
[l̥]

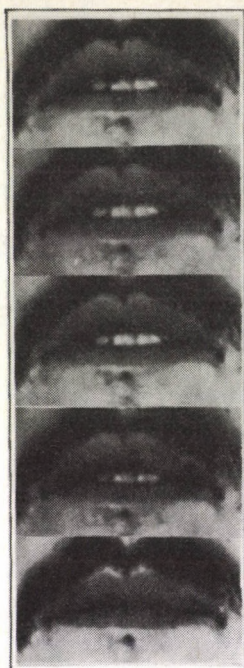
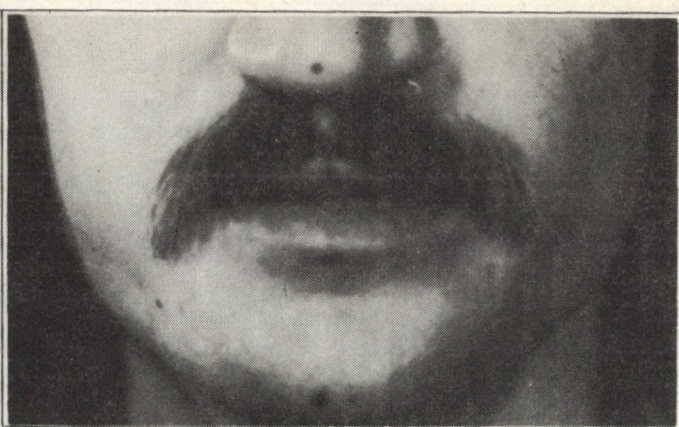
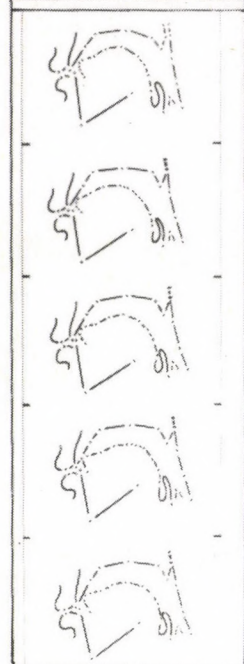
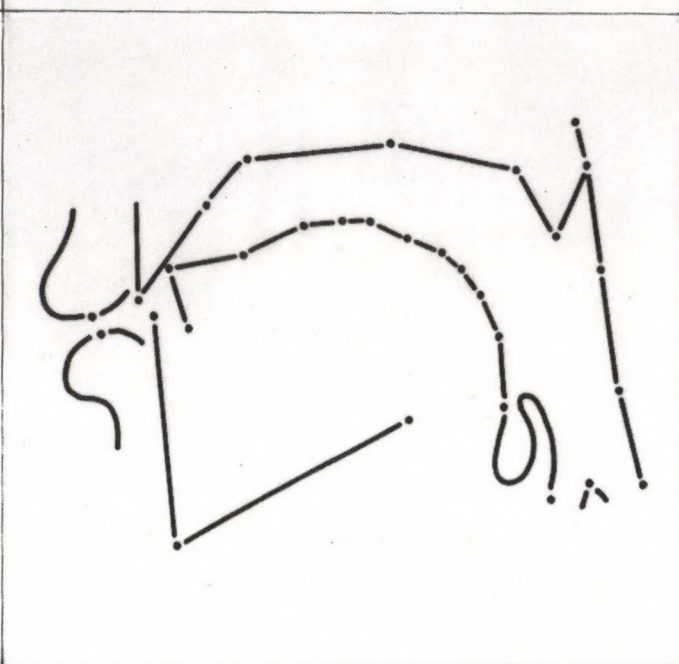
[myśl̥]

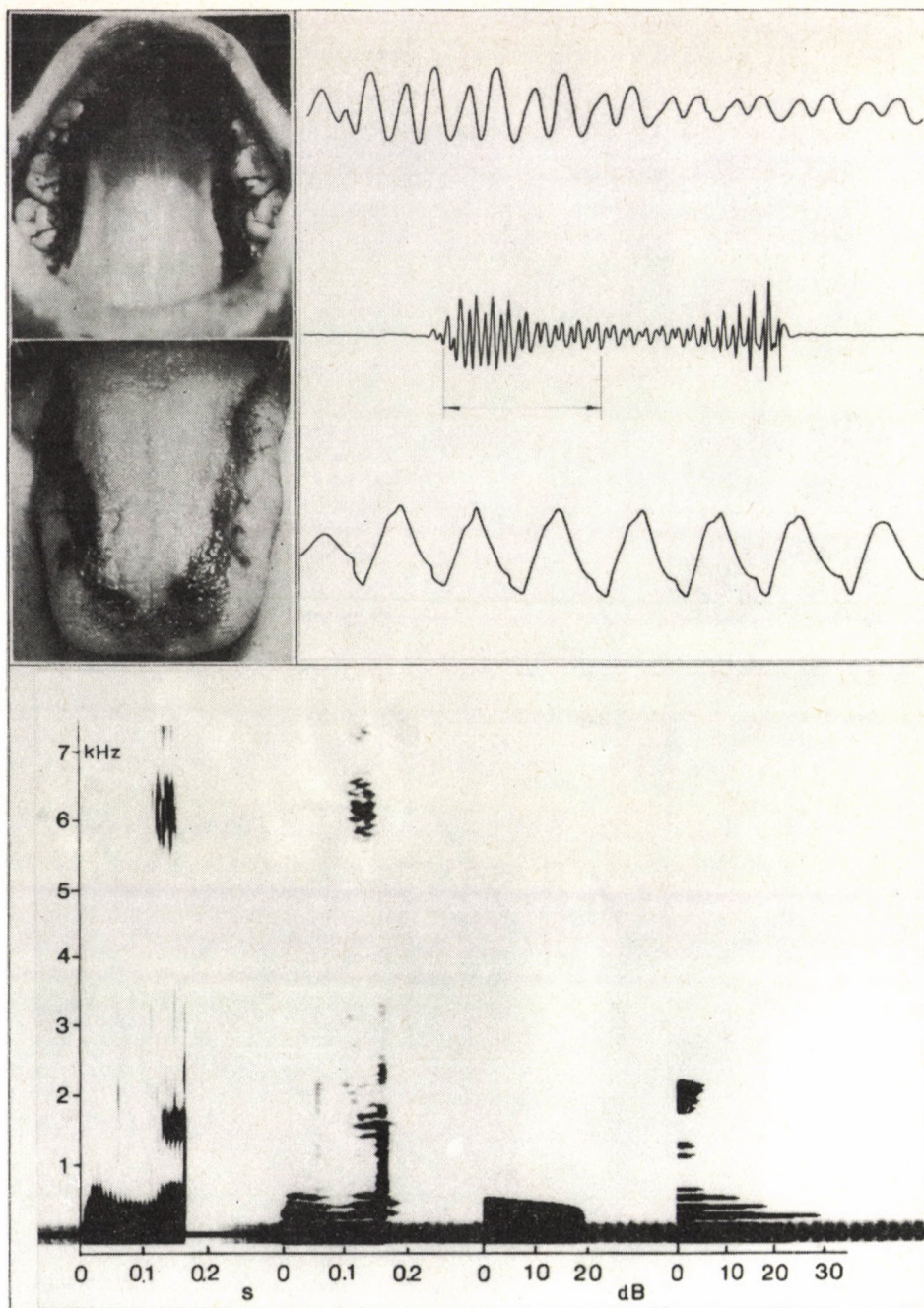


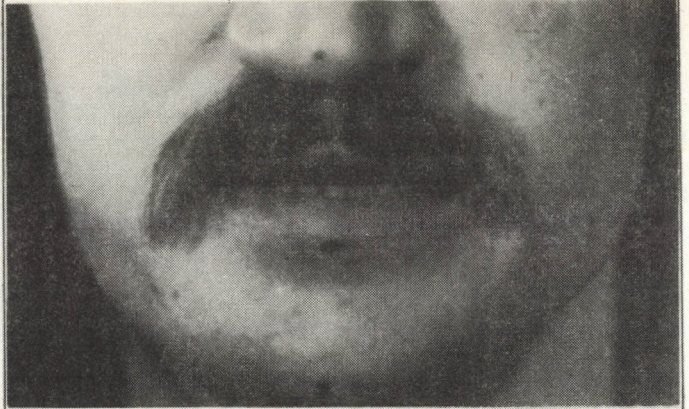
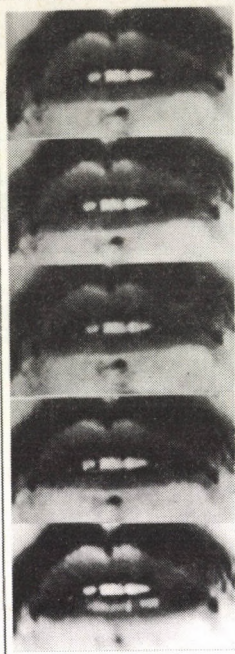






	
	<p>[dz] [dzban]</p> <p>dzban</p> <p>[3] [3ban]</p> <p style="font-size: 2em; float: right;">84</p>
	





[ts]

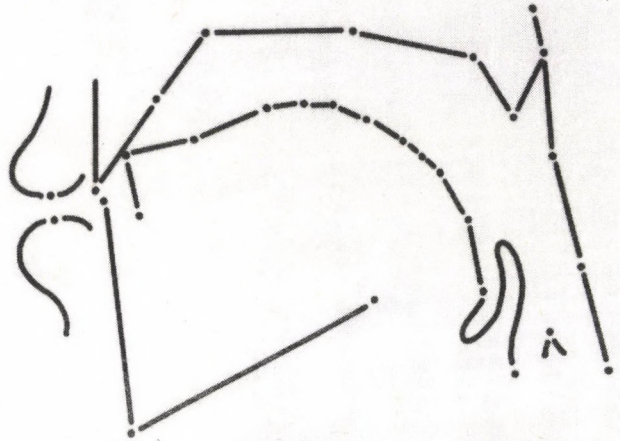
[tsar]

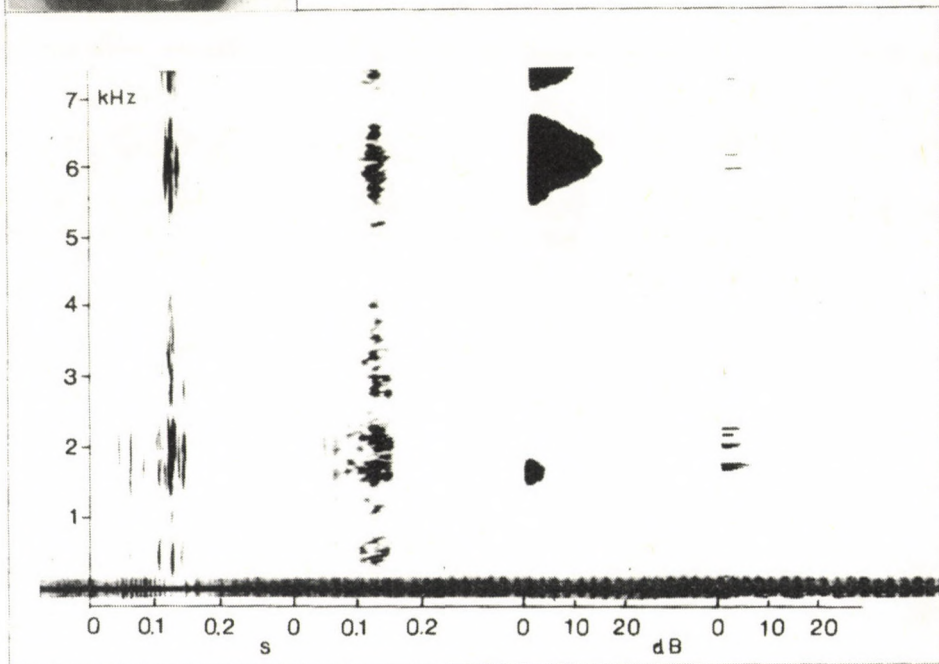
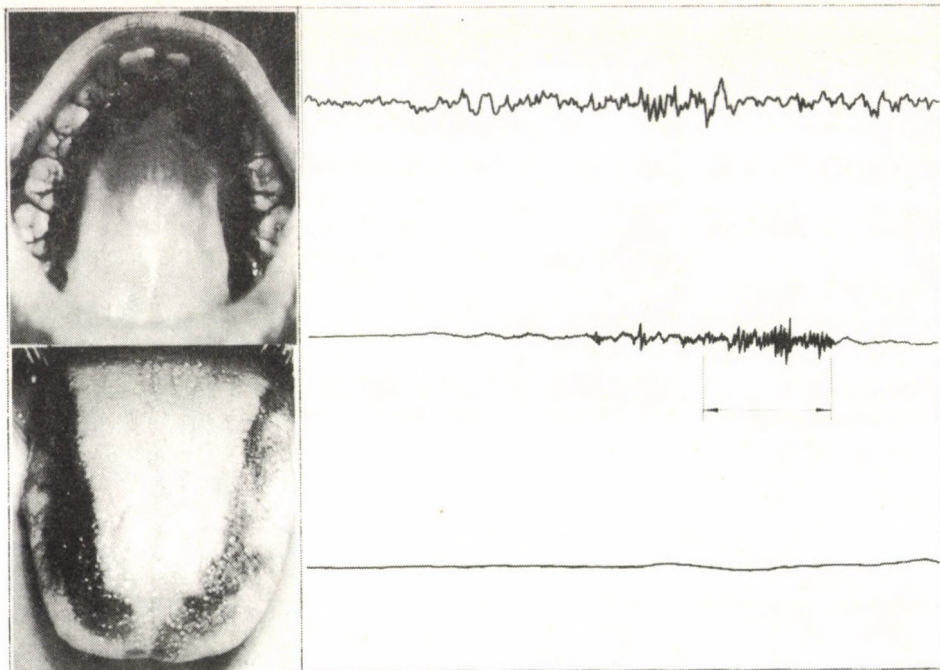
car

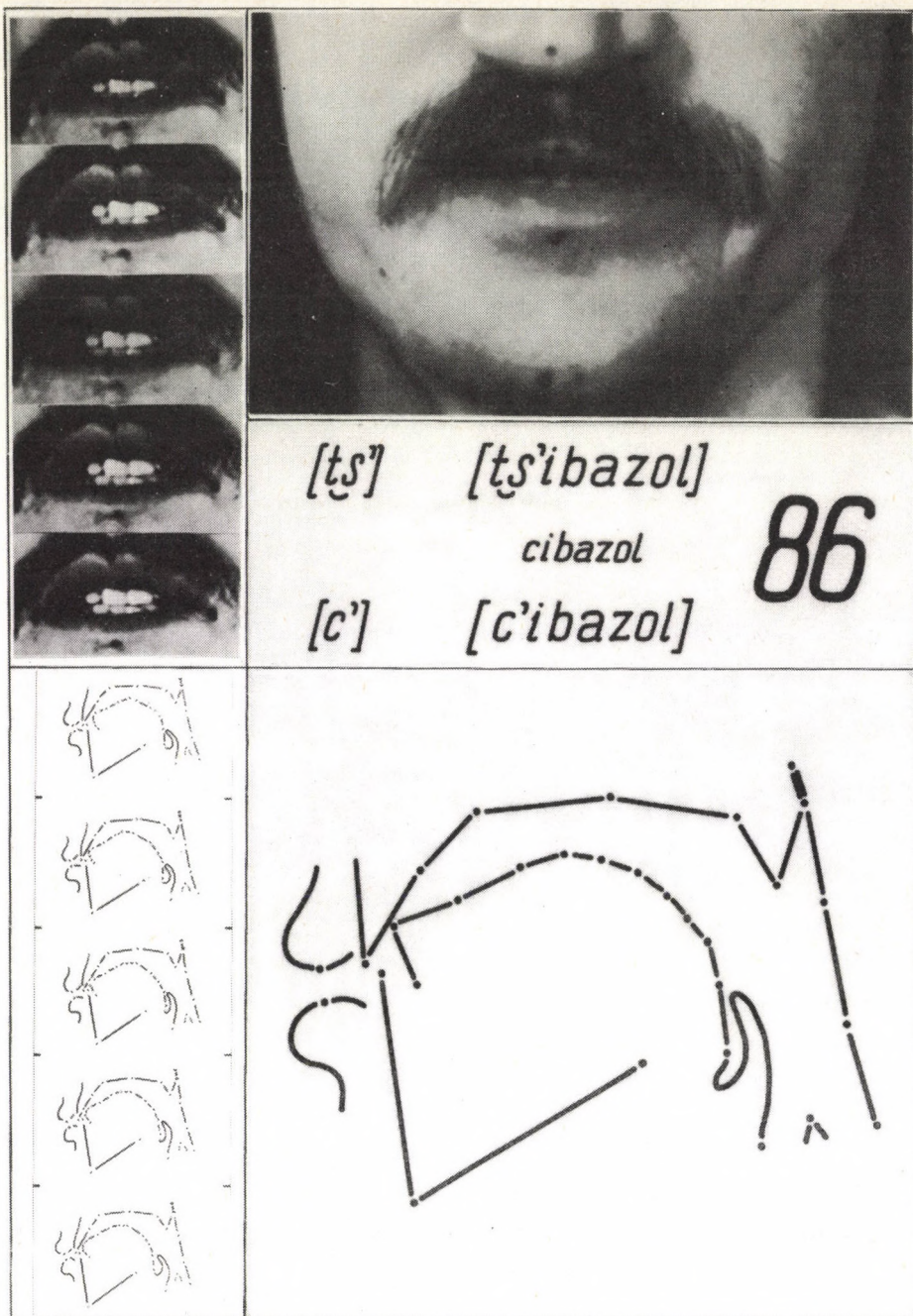
[c]

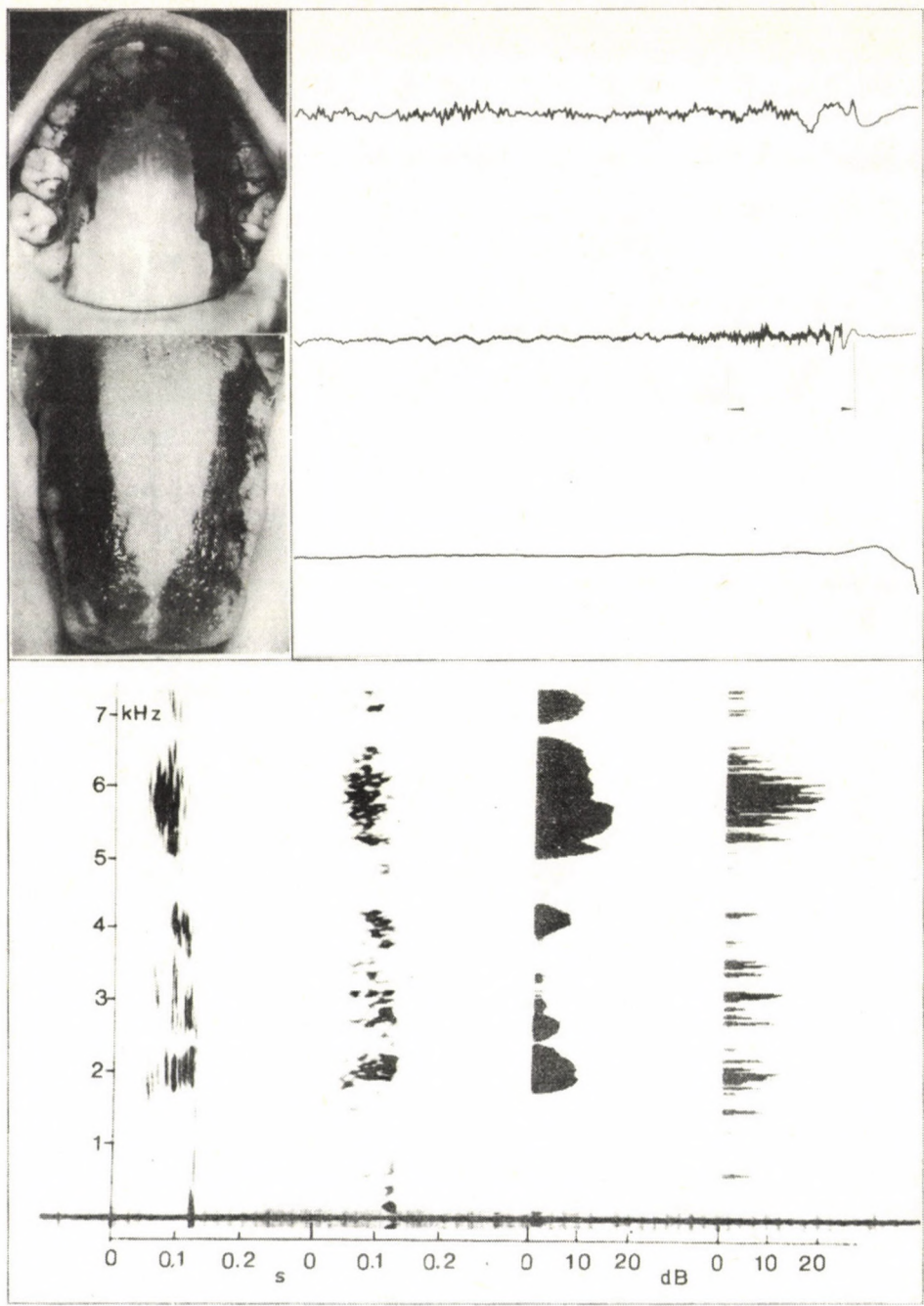
[car]

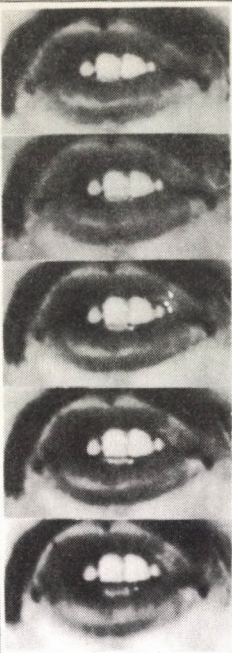
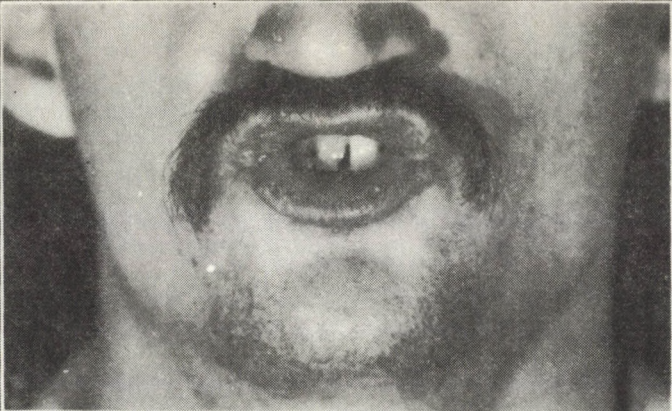
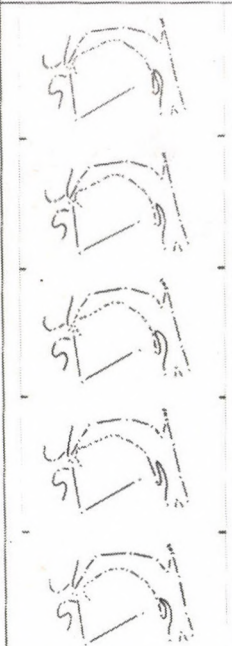
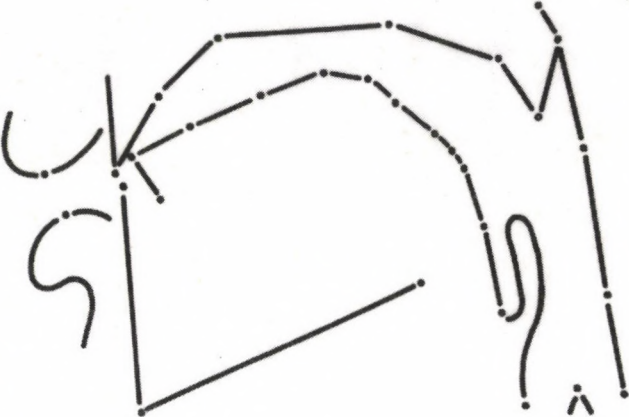
85

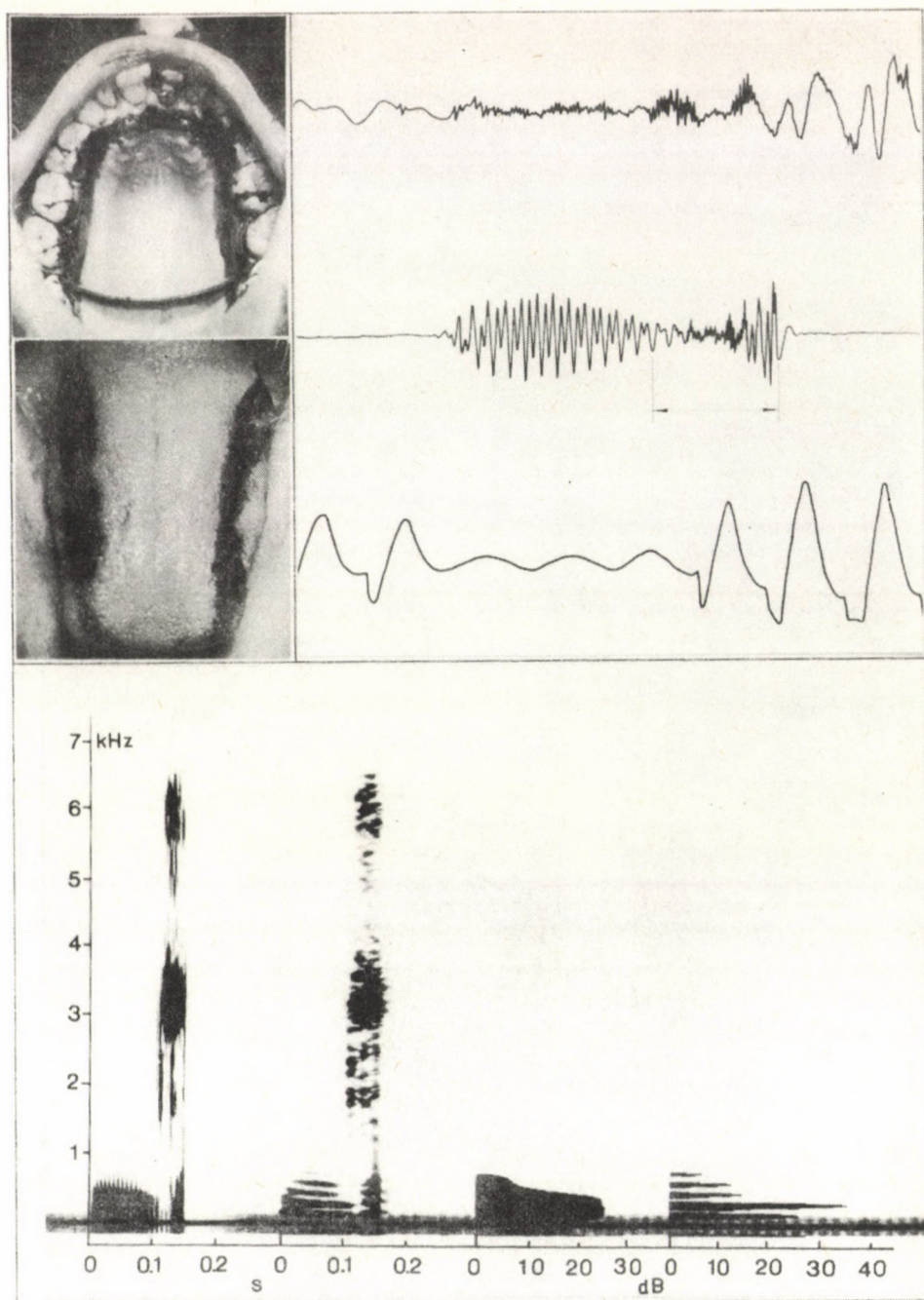




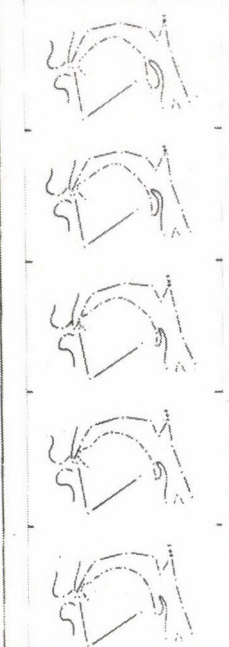



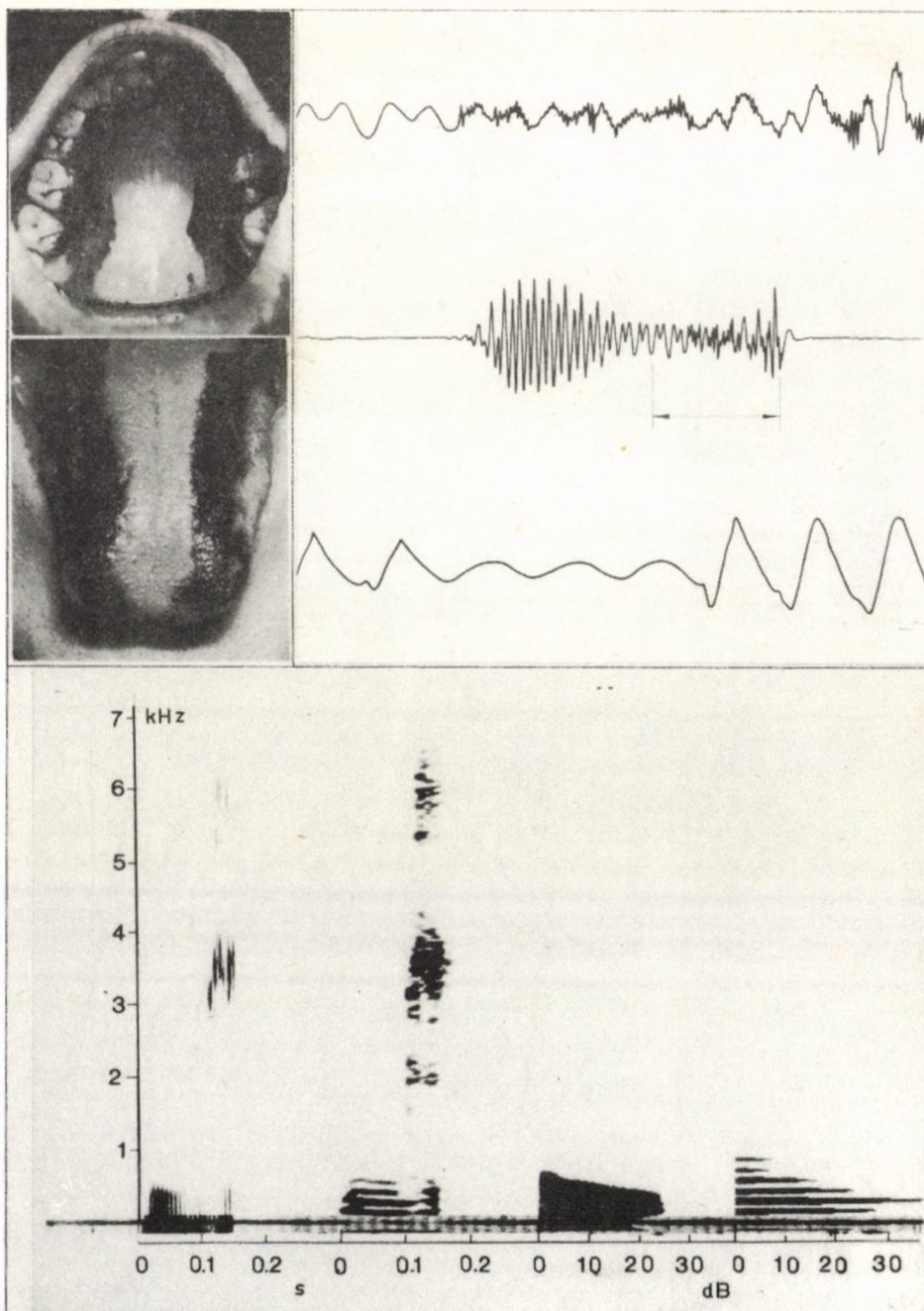


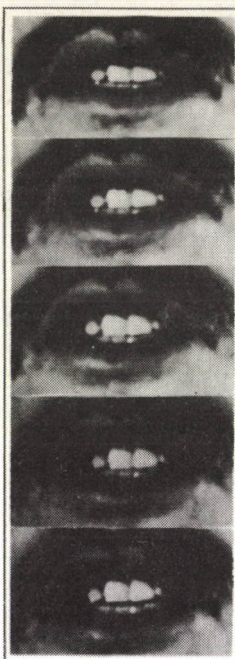
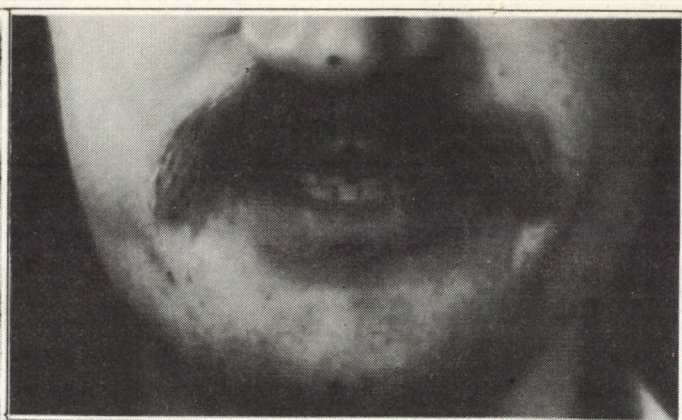
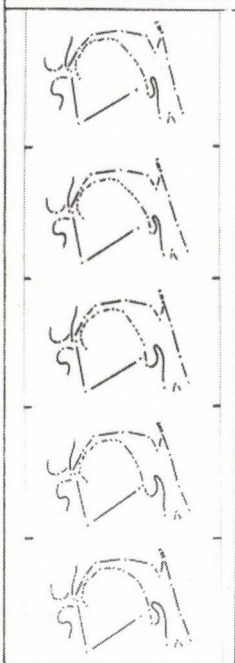
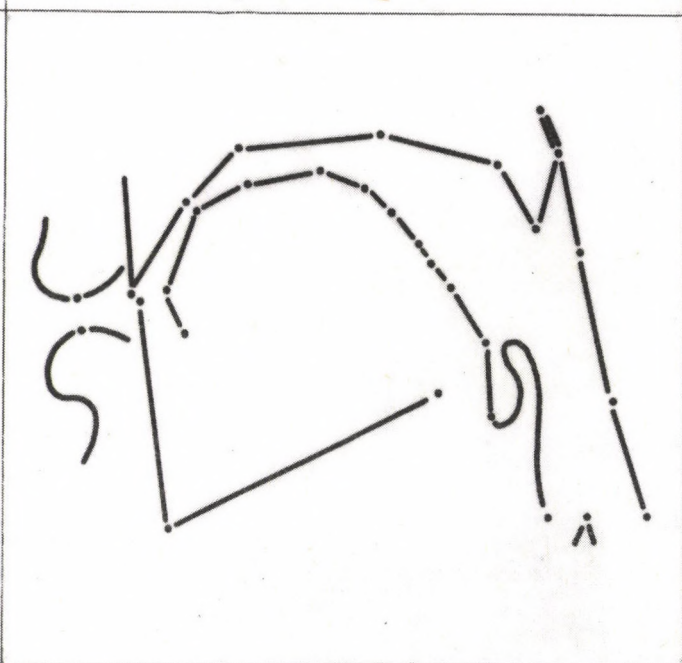


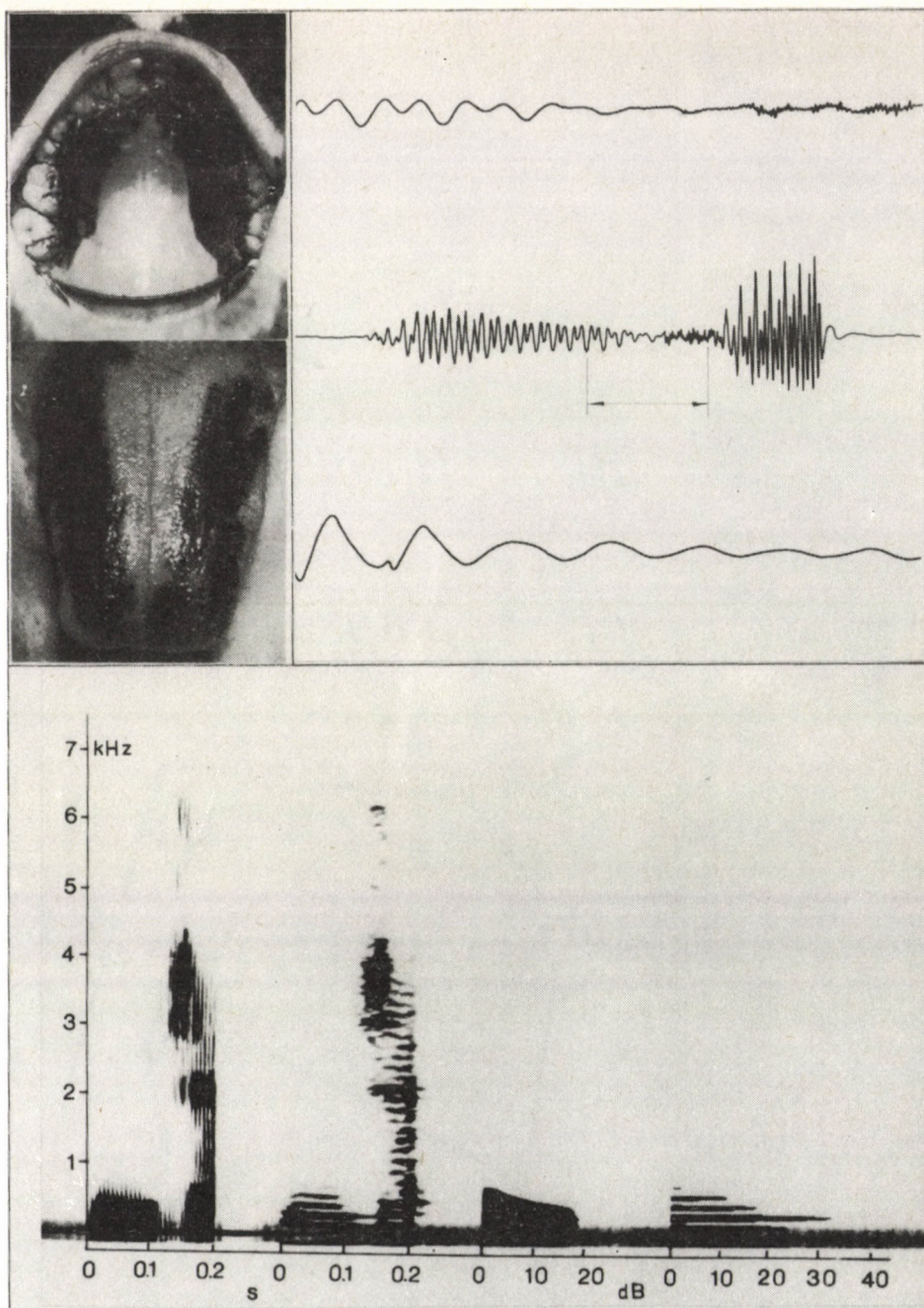
	
	<p> <i>[dʒ]</i> <i>[dʒõŋka]</i> <i>dzonka</i> <i>[ʒ]</i> <i>[ʒõŋka]</i> </p> <p style="text-align: right; font-size: 2em;">87</p> 

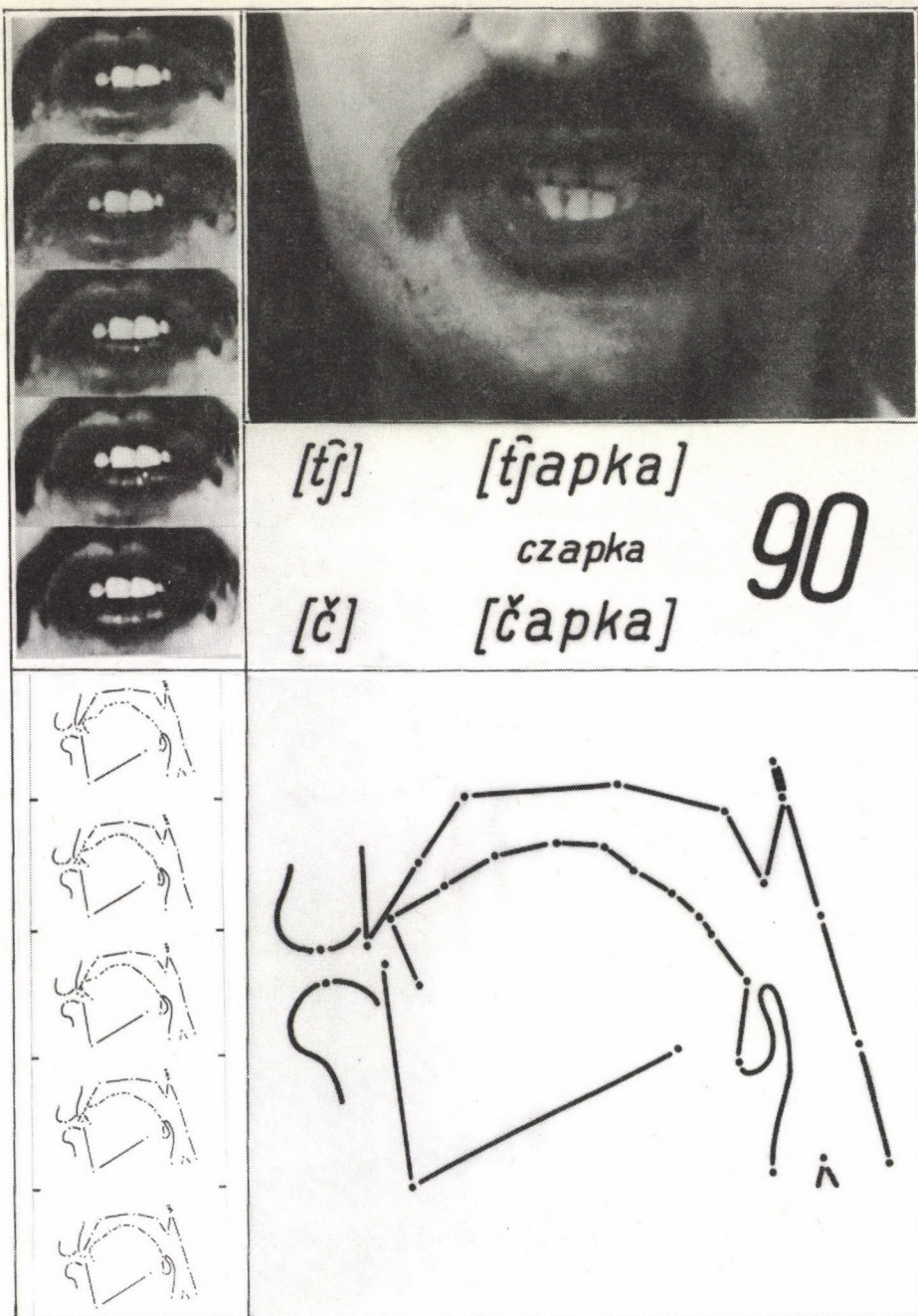


	
	<p> $[d\hat{z}]$ $[d\hat{z}'i'st]$ <i>dzinsy</i> $[\hat{z}]$ $[\hat{z}'i'sy]$ </p> <p style="text-align: right; font-size: 2em;">88</p>
	



	
	<p> <i>[dʑ]</i> <i>[dʑædɨ]</i> <i>dziady</i> </p> <p> <i>[ʑ]</i> <i>[ʑädy]</i> </p> <p style="text-align: right; font-size: 2em;">89</p>
	



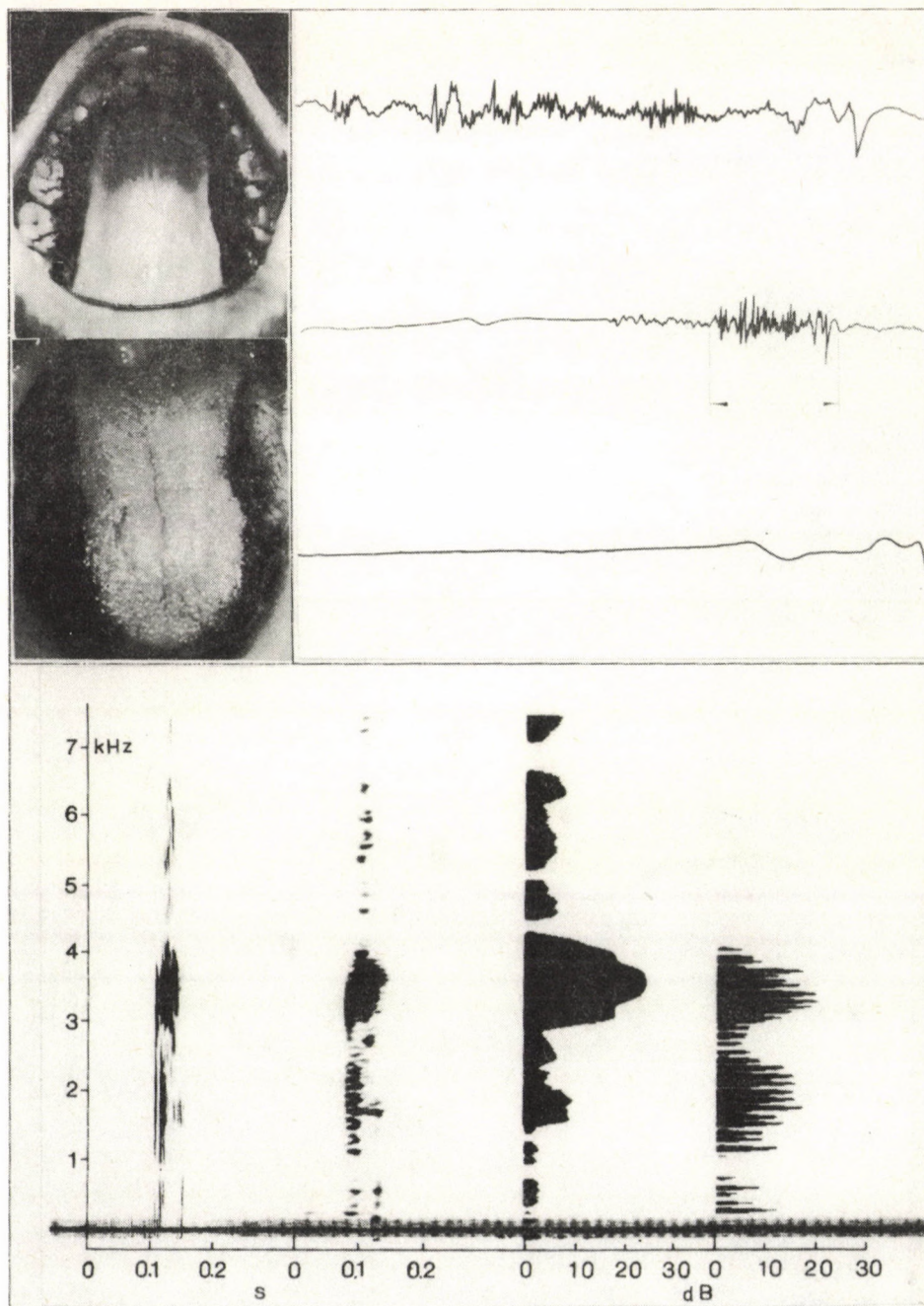


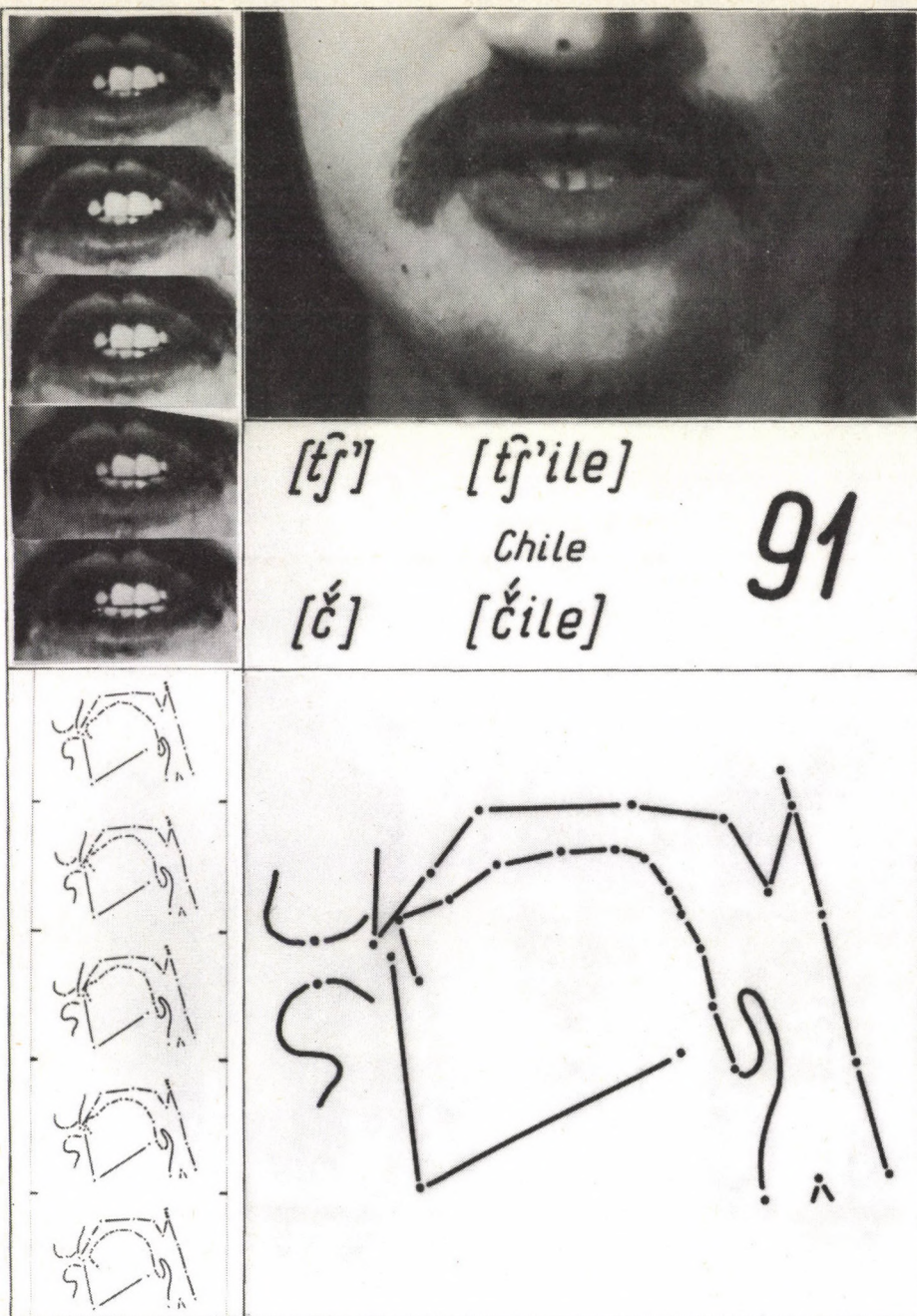
[tʃ] [tʃapka]

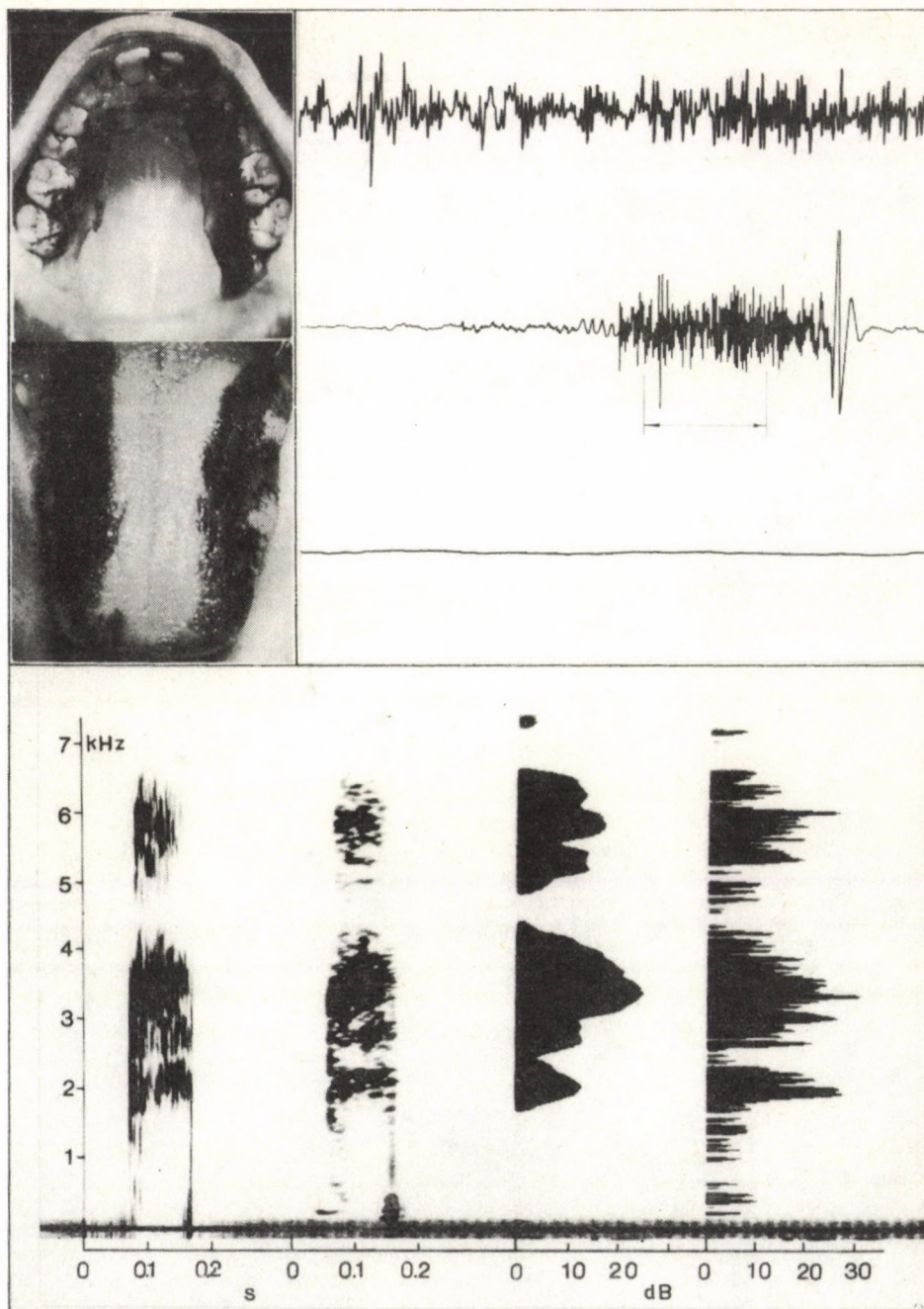
czapka

[č] [čapka]

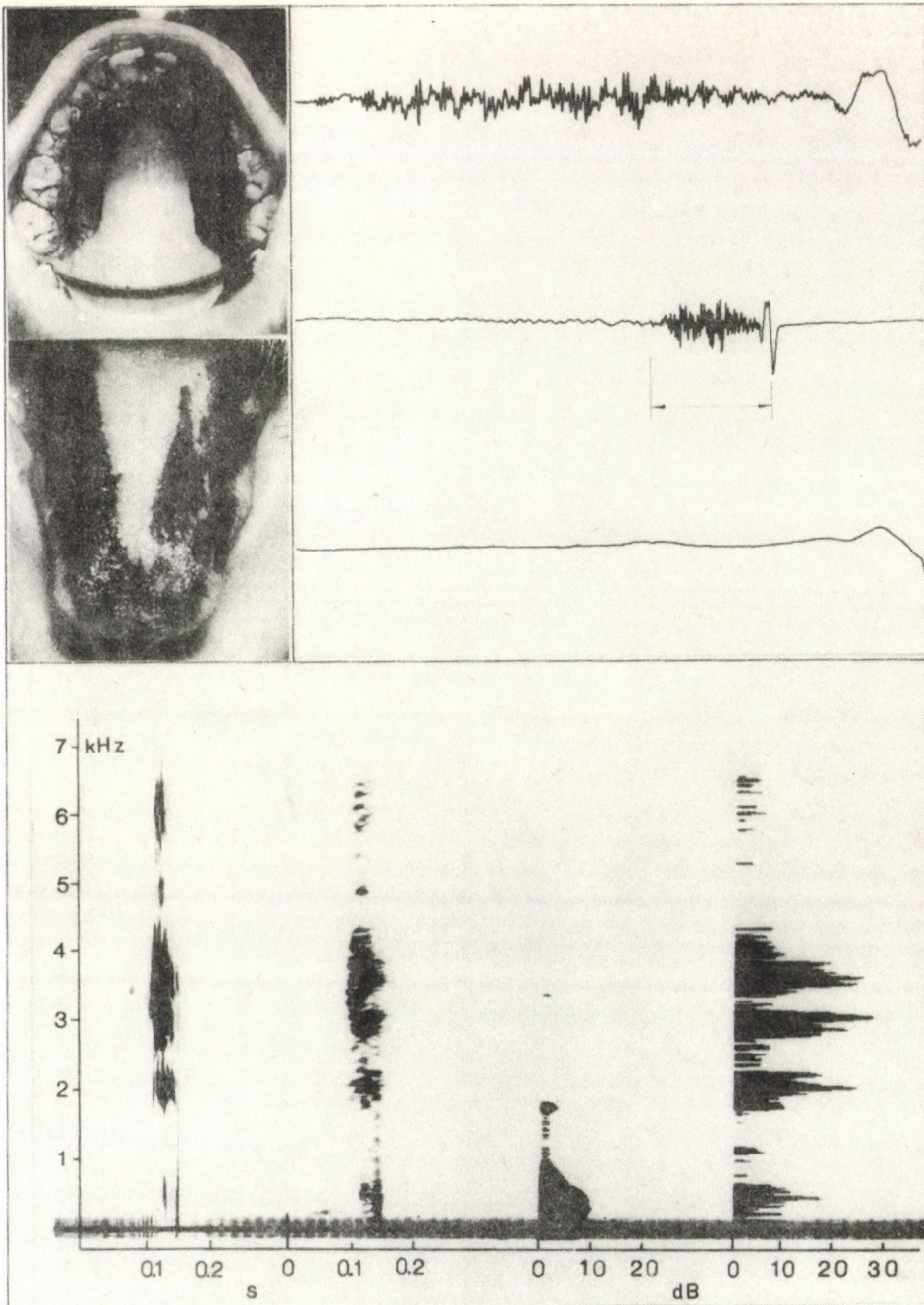
90











DYNAMIC LABIOGRAM DATA OF MEASUREMENT FOR POLISH SPEECH

SOUNDS

DANE DYNAMICZNYCH LABIOGRAMÓW GŁOSEK POLSKICH

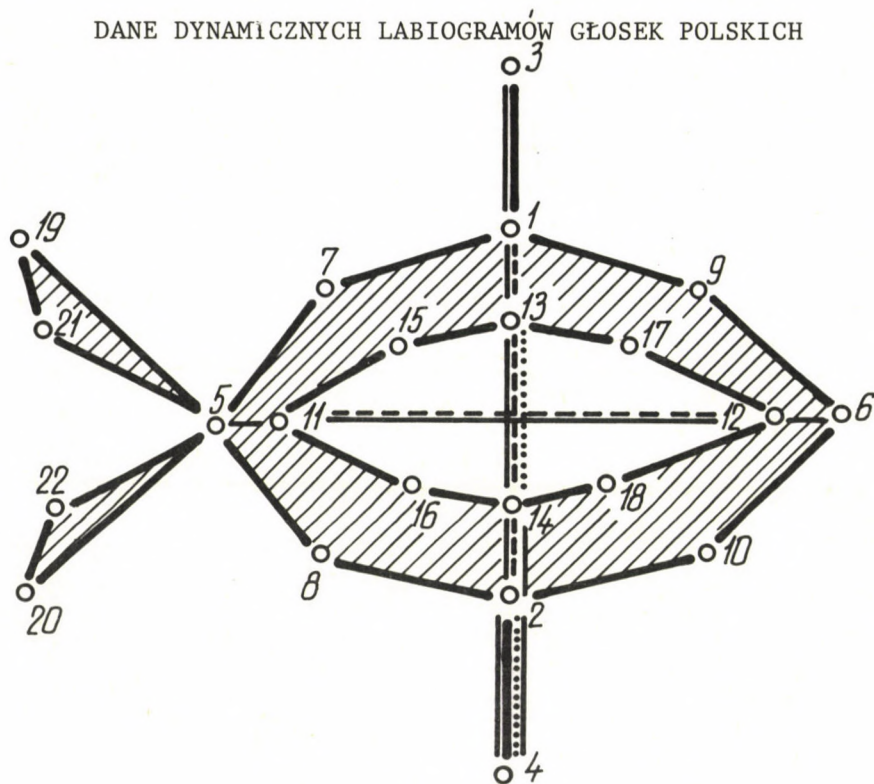


Figure 1

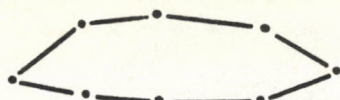
This schematic labiogram contour shows the location of measurement points for the investigations of lip activity. The pairs of points linked by solid lines represent the measurement relations in terms of which the data given in the tables (pp. 211--288) are to be interpreted. The area data of the lip orifice, marked by points 11 to 18, are given in the tables on pp. 353--358 in relative percentage of the orifice area of the 3rd frame (= the pure phase of the sound involved).

1

[a]



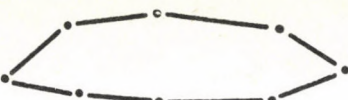
1	3-4	= 65	5-6	= 42
2		= 66		= 43
3		= 67		= 44
4		= 67		= 43
5		= 65		= 42



1	1-2	= 23	11-12	= 31
2		= 24		= 35
3		= 25		= 37
4		= 25		= 37
5		= 23		= 35



1	13-14	= 10	4-14	= 29
2		= 10		= 30
3		= 11		= 30
4		= 10		= 30
5		= 8		= 30

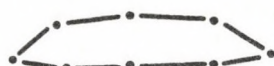


1	3-13	= 26	4-2	= 23
2		= 26		= 23
3		= 26		= 23
4		= 27		= 22
5		= 27		= 23



2

[ã]



1	3-4	= 61	5-6	= 42
2		= 59		= 43
3		= 61		= 42
4		= 66		= 40
5		= 62		= 41



1	1-2	= 19	11-12	= 28
2		= 18		= 28
3		= 20		= 28
4		= 24		= 30
5		= 20		= 32



1	13-14	= 6	4-14	= 29
2		= 6		= 28
3		= 7		= 29
4		= 11		= 29
5		= 9		= 27



1	3-13	= 26	4-2	= 23
2		= 25		= 22
3		= 25		= 22
4		= 26		= 22
5		= 26		= 22



1 3-4 = 61
2 = 65
3 = 65
4 = 64
5 = 61

5-6 = 44
= 43
= 42
= 43
= 43

[æ]

3

1 1-2 = 24
2 = 25
3 = 25
4 = 24
5 = 22

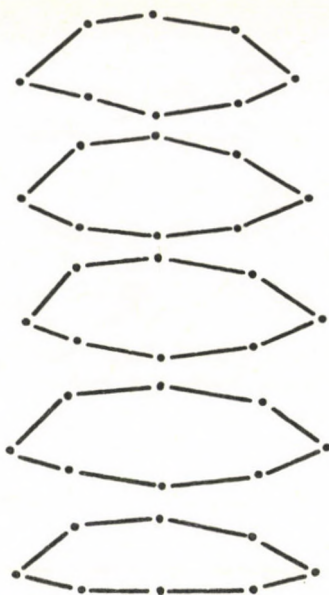
11-12 = 29
= 30
= 31
= 33
= 31

1 13-14 = 11
2 = 11
3 = 11
4 = 11
5 = 8

4-14 = 28
= 29
= 29
= 28
= 28

1 3-13 = 22
2 = 25
3 = 25
4 = 25
5 = 24

4-2 = 21
= 22
= 22
= 22
= 21



1 3-4 = 64
2 = 66
3 = 66
4 = 65
5 = 61

5-6 = 43
= 43
= 44
= 44
= 44

[æ]

4

1 1-2 = 25
2 = 24
3 = 25
4 = 24
5 = 21

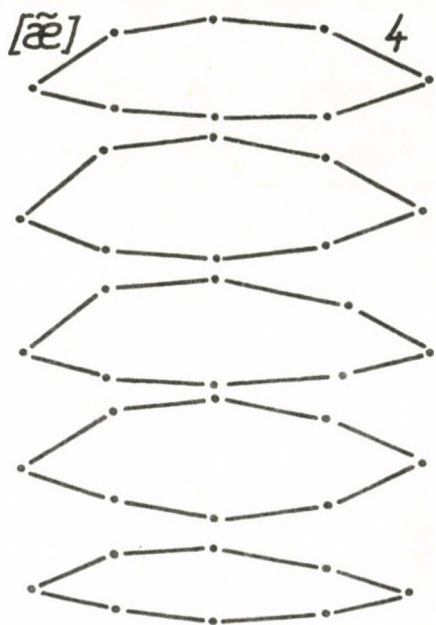
11-12 = 35
= 35
= 36
= 35
= 33

1 13-14 = 9
2 = 11
3 = 10
4 = 11
5 = 7

4-14 = 29
= 29
= 30
= 28
= 28

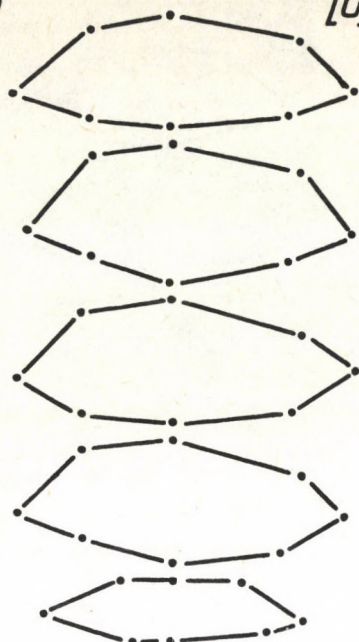
1 3-13 = 26
2 = 26
3 = 26
4 = 26
5 = 25

4-2 = 22
= 23
= 22
= 22
= 22



5

[0]



1	3-4	= 66	5-6	= 41
2		= 67		= 40
3		= 66		= 40
4		= 64		= 41
5		= 61		= 42

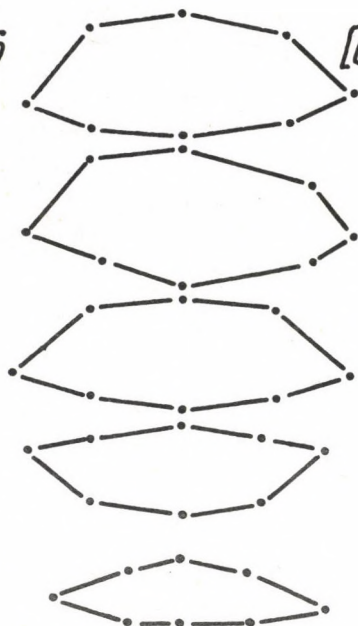
1	1-2	= 24	11-12	= 26
2		= 26		= 25
3		= 26		= 26
4		= 23		= 25
5		= 20		= 20

1	13-14	= 9	4-14	= 31
2		= 11		= 30
3		= 10		= 31
4		= 10		= 29
5		= 5		= 31

1	3-13	= 26	4-2	= 23
2		= 26		= 22
3		= 25		= 22
4		= 25		= 22
5		= 25		= 22

6

[0̃]



1	3-4	= 66	5-6	= 40
2		= 65		= 39
3		= 64		= 40
4		= 62		= 41
5		= 60		= 42

1	1-2	= 25	11-12	= 25
2		= 26		= 25
3		= 24		= 26
4		= 21		= 23
5		= 19		= 21

1	13-14	= 10	4-14	= 31
2		= 11		= 30
3		= 9		= 30
4		= 7		= 30
5		= 5		= 30

1	3-13	= 25	4-2	= 22
2		= 24		= 21
3		= 25		= 22
4		= 25		= 22
5		= 25		= 22

$$\begin{array}{rcl}
 1 & 3-4 & = 61 \\
 2 & & = 62 \\
 3 & & = 61 \\
 4 & & = 60 \\
 5 & & = 59
 \end{array}$$

$$\begin{array}{rcl}
 1 & 1-2 & = 25 \\
 2 & & = 24 \\
 3 & & = 24 \\
 4 & & = 23 \\
 5 & & = 20
 \end{array}$$

$$\begin{array}{rcl}
 1 & 13-14 & = 10 \\
 2 & & = 10 \\
 3 & & = 9 \\
 4 & & = 8 \\
 5 & & = 6
 \end{array}$$

$$\begin{array}{rcl}
 1 & 3-13 & = 22 \\
 2 & & = 22 \\
 3 & & = 22 \\
 4 & & = 22 \\
 5 & & = 23
 \end{array}$$

$$\begin{array}{rcl}
 5-6 & = & 42 \\
 & = & 41 \\
 & = & 42 \\
 & = & 41 \\
 & = & 41
 \end{array}$$

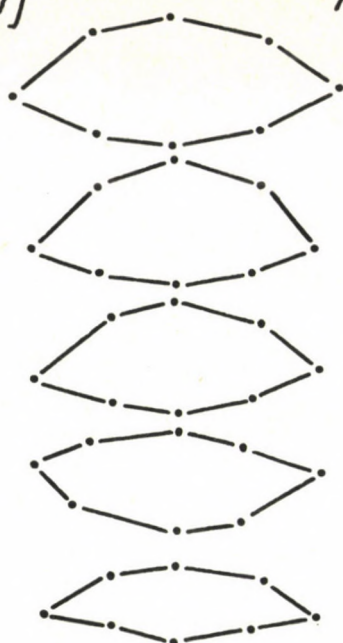
$$\begin{array}{rcl}
 11-12 & = & 25 \\
 & = & 22 \\
 & = & 22 \\
 & = & 22 \\
 & = & 21
 \end{array}$$

$$\begin{array}{rcl}
 4-14 & = & 29 \\
 & = & 30 \\
 & = & 30 \\
 & = & 30 \\
 & = & 30
 \end{array}$$

$$\begin{array}{rcl}
 4-2 & = & 20 \\
 & = & 21 \\
 & = & 21 \\
 & = & 21 \\
 & = & 22
 \end{array}$$

$[q]$

7



$$\begin{array}{rcl}
 1 & 3-4 & = 57 \\
 2 & & = 58 \\
 3 & & = 58 \\
 4 & & = 58 \\
 5 & & = 59
 \end{array}$$

$$\begin{array}{rcl}
 1 & 1-2 & = 19 \\
 2 & & = 20 \\
 3 & & = 20 \\
 4 & & = 20 \\
 5 & & = 20
 \end{array}$$

$$\begin{array}{rcl}
 1 & 13-14 & = 5 \\
 2 & & = 6 \\
 3 & & = 6 \\
 4 & & = 6 \\
 5 & & = 6
 \end{array}$$

$$\begin{array}{rcl}
 1 & 3-13 & = 23 \\
 2 & & = 24 \\
 3 & & = 24 \\
 4 & & = 24 \\
 5 & & = 24
 \end{array}$$

$$\begin{array}{rcl}
 5-6 & = & 42 \\
 & = & 43 \\
 & = & 43 \\
 & = & 43 \\
 & = & 43
 \end{array}$$

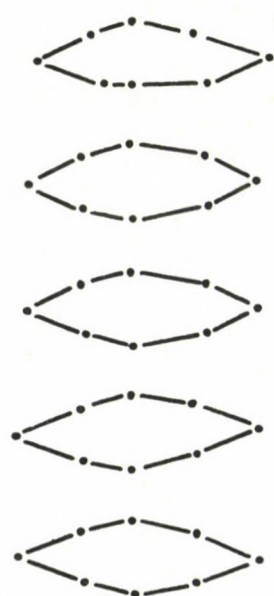
$$\begin{array}{rcl}
 11-12 & = & 18 \\
 & = & 18 \\
 & = & 18 \\
 & = & 19 \\
 & = & 19
 \end{array}$$

$$\begin{array}{rcl}
 4-14 & = & 29 \\
 & = & 28 \\
 & = & 28 \\
 & = & 28 \\
 & = & 29
 \end{array}$$

$$\begin{array}{rcl}
 4-2 & = & 21 \\
 & = & 21 \\
 & = & 21 \\
 & = & 21 \\
 & = & 22
 \end{array}$$

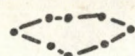
$[q]$

8

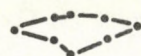


9

[u]



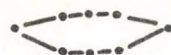
1	3-4	= 61	5-6	= 37
2		= 61		= 37
3		= 60		= 36
4		= 61		= 38
5		= 61		= 40



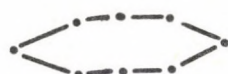
1	1-2	= 21	11-12	= 9
2		= 22		= 9
3		= 21		= 10
4		= 22		= 12
5		= 21		= 16



1	13-14	= 3	4-14	= 32
2		= 3		= 32
3		= 3		= 32
4		= 3		= 32
5		= 4		= 31



1	3-13	= 26	4-2	= 22
2		= 26		= 22
3		= 25		= 22
4		= 26		= 22
5		= 26		= 22



10

[ū]



1	3-4	= 67	5-6	= 34
2		= 66		= 34
3		= 65		= 36
4		= 64		= 37
5		= 63		= 39



1	1-2	= 22	11-12	= 7
2		= 22		= 11
3		= 22		= 11
4		= 21		= 12
5		= 21		= 14



1	13-14	= 4	4-14	= 33
2		= 4		= 32
3		= 4		= 32
4		= 4		= 31
5		= 6		= 30



1	3-13	= 30	4-2	= 23
2		= 30		= 22
3		= 29		= 22
4		= 29		= 21
5		= 27		= 21



1	3-4	= 57
2		= 58
3		= 57
4		= 58
5		= 58

5-6	= 37
	= 36
	= 36
	= 36
	= 38

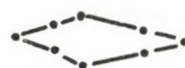
$[u]_+$

11



1	1-2	= 24
2		= 24
3		= 24
4		= 24
5		= 23

11-12	= 12
	= 13
	= 9
	= 9
	= 12



1	13-14	= 5
2		= 4
3		= 4
4		= 4
5		= 5

4-14	= 29
	= 30
	= 29
	= 29
	= 29



1	3-13	= 23
2		= 24
3		= 24
4		= 25
5		= 24

4-2	= 19
	= 19
	= 19
	= 19
	= 19

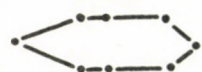


1	3-4	= 59
2		= 59
3		= 59
4		= 58
5		= 59

5-6	= 39
	= 39
	= 39
	= 38
	= 39

$[\tilde{u}]_+$

12



1	1-2	= 22
2		= 23
3		= 22
4		= 22
5		= 22

11-12	= 14
	= 14
	= 13
	= 14
	= 14



1	13-14	= 4
2		= 5
3		= 4
4		= 5
5		= 4

4-14	= 30
	= 29
	= 30
	= 29
	= 30



1	3-13	= 25
2		= 25
3		= 25
4		= 24
5		= 25

4-2	= 20
	= 20
	= 20
	= 20
	= 20

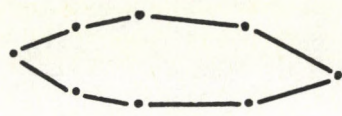


13

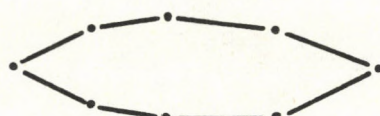
[t]



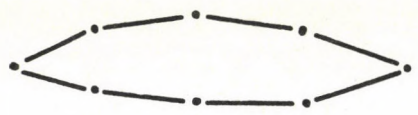
1	3-4 = 63	5-6 = 45
2	= 64	= 45
3	= 64	= 45
4	= 64	= 45
5	= 64	= 45



1	1-2 = 19	11-12 = 13
2	= 21	= 25
3	= 21	= 23
4	= 21	= 30
5	= 20	= 31



1	13-14 = 3	4-14 = 31
2	= 7	= 30
3	= 8	= 29
4	= 7	= 30
5	= 6	= 30



1	3-13 = 29	4-2 = 23
2	= 27	= 22
3	= 27	= 22
4	= 27	= 22
5	= 26	= 23



14

[t]



1	3-4 = 63	5-6 = 44
2	= 62	= 43
3	= 64	= 44
4	= 63	= 43
5	= 62	= 44



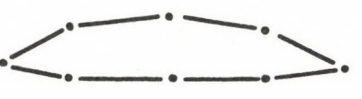
1	1-2 = 18	11-12 = 26
2	= 18	= 26
3	= 18	= 26
4	= 18	= 26
5	= 18	= 26



1	13-14 = 6	4-14 = 28
2	= 5	= 29
3	= 5	= 29
4	= 5	= 29
5	= 5	= 29



1	3-13 = 29	4-2 = 22
2	= 28	= 22
3	= 30	= 22
4	= 29	= 22
5	= 28	= 22



1	3-4	= 62
2		= 62
3		= 62
4		= 62
5		= 62

5-6	= 43
	= 43
	= 44
	= 44
	= 44

[i]

15



1	1-2	= 21
2		= 23
3		= 22
4		= 23
5		= 22

11-12	= 21
	= 23
	= 25
	= 25
	= 26



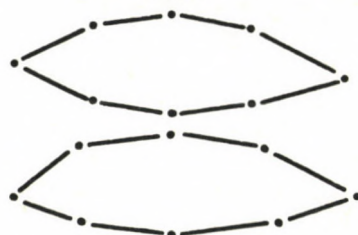
1	13-14	= 6
2		= 8
3		= 8
4		= 8
5		= 8

4-14	= 30
	= 29
	= 29
	= 29
	= 29



1	3-13	= 26
2		= 25
3		= 25
4		= 25
5		= 25

4-2	= 22
	= 21
	= 22
	= 21
	= 21



1	3-4	= 62
2		= 62
3		= 62
4		= 63
5		= 63

5-6	= 43
	= 43
	= 42
	= 43
	= 42

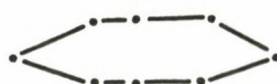
[i]

16



1	1-2	= 19
2		= 20
3		= 19
4		= 20
5		= 20

11-12	= 18
	= 20
	= 20
	= 21
	= 22



1	13-14	= 4
2		= 5
3		= 7
4		= 6
5		= 6

4-14	= 30
	= 30
	= 28
	= 29
	= 29



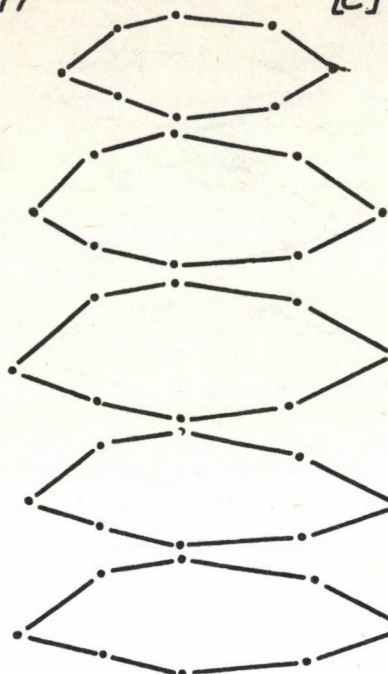
1	3-13	= 28
2		= 27
3		= 27
4		= 28
5		= 28

4-2	= 22
	= 22
	= 22
	= 22
	= 22



17

[e]



1	3-4	= 66
2		= 67
3		= 67
4		= 66
5		= 66

5-6	= 43
	= 43
	= 44
	= 43
	= 43

1	1-2	= 23
2		= 25
3		= 26
4		= 24
5		= 23

11-12	= 23
	= 29
	= 32
	= 31
	= 33

1	13-14	= 9
2		= 12
3		= 12
4		= 10
5		= 10

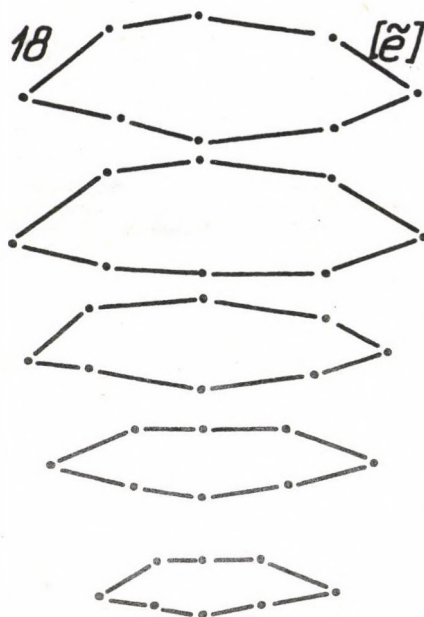
4-14	= 30
	= 29
	= 29
	= 29
	= 29

1	3-13	= 27
2		= 26
3		= 26
4		= 27
5		= 27

4-2	= 23
	= 22
	= 22
	= 22
	= 23

18

[ē]



1	3-4	= 65
2		= 65
3		= 63
4		= 62
5		= 61

5-6	= 43
	= 43
	= 42
	= 42
	= 41

1	1-2	= 22
2		= 25
3		= 21
4		= 20
5		= 20

11-12	= 33
	= 35
	= 30
	= 27
	= 20

1	13-14	= 11
2		= 10
3		= 8
4		= 6
5		= 5

4-14	= 28
	= 29
	= 30
	= 30
	= 31

1	3-13	= 26
2		= 26
3		= 25
4		= 26
5		= 25

4-2	= 23
	= 21
	= 23
	= 23
	= 23

1	3-4	= 64
2		= 65
3		= 66
4		= 66
5		= 64

1	1-2	= 24
2		= 24
3		= 24
4		= 25
5		= 21

1	13-14	= 10
2		= 11
3		= 10
4		= 10
5		= 8

1	3-13	= 25
2		= 25
3		= 26
4		= 26
5		= 26

5-6	= 42
	= 43
	= 42
	= 44
	= 43

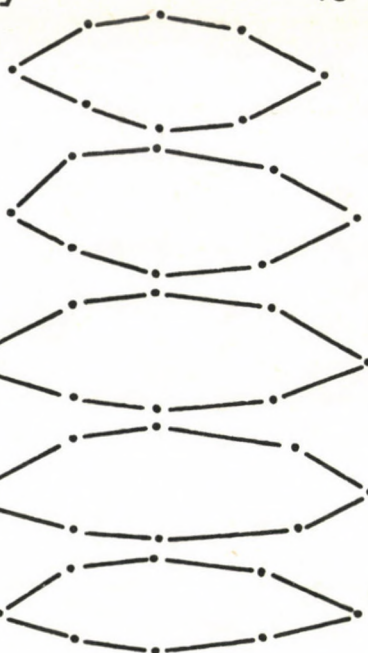
11-12	= 26
	= 23
	= 34
	= 35
	= 30

4-14	= 23
	= 23
	= 30
	= 30
	= 30

4-2	= 22
	= 22
	= 23
	= 22
	= 24

[e]

19



1	3-4	= 53
2		= 53
3		= 56
4		= 56
5		= 56

1	1-2	= 18
2		= 13
3		= 13
4		= 13
5		= 13

1	13-14	= 4
2		= 4
3		= 3
4		= 3
5		= 4

1	3-13	= 25
2		= 25
3		= 25
4		= 25
5		= 24

5-6	= 42
	= 42
	= 42
	= 42
	= 42

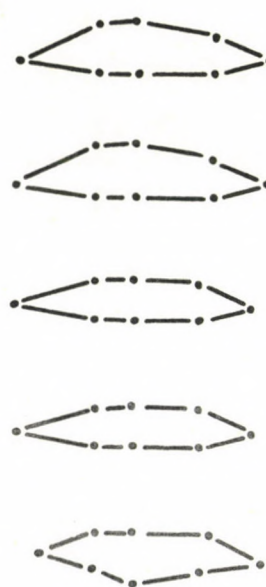
11-12	= 13
	= 13
	= 13
	= 13
	= 17

4-14	= 23
	= 23
	= 23
	= 23
	= 23

4-2	= 22
	= 22
	= 20
	= 20
	= 20

[ẽ]

20

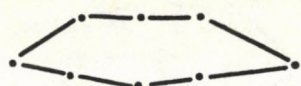


21

[w]



1	3 - 4 = 63	5 - 6 = 40
2	= 68	= 39
3	= 68	= 38
4	= 68	= 38
5	= 63	= 39



1	1 - 2 = 26	11 - 12 = 31
2	= 22	= 24
3	= 21	= 20
4	= 21	= 16
5	= 24	= 20



1	13 - 14 = 10	4 - 14 = 30
2	= 6	= 31
3	= 5	= 32
4	= 4	= 32
5	= 8	= 32

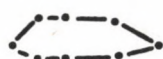


1	3 - 13 = 23	4 - 2 = 22
2	= 31	= 23
3	= 31	= 24
4	= 32	= 24
5	= 23	= 23

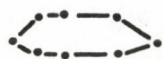


22

[w]



1	3 - 4 = 57	5 - 6 = 39
2	= 57	= 39
3	= 56	= 40
4	= 57	= 40
5	= 58	= 41



1	1 - 2 = 20	11 - 12 = 11
2	= 20	= 11
3	= 21	= 11
4	= 21	= 11
5	= 20	= 12



1	13 - 14 = 3	4 - 14 = 30
2	= 3	= 30
3	= 4	= 29
4	= 4	= 30
5	= 4	= 30



1	3 - 13 = 24	4 - 2 = 21
2	= 24	= 21
3	= 23	= 20
4	= 23	= 21
5	= 24	= 22

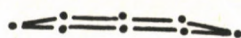


1 3-4 = 60
2 = 59
3 = 59
4 = 60
5 = 63

5-6 = 39
= 40
= 38
= 39
= 40

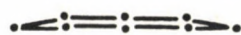
[b]

23



1 1-2 = 14
2 = 15
3 = 15
4 = 15
5 = 25

11-12 = 18
= 18
= 19
= 19
= 21



1 13-14 = 1
2 = 1
3 = 1
4 = 1
5 = 8

4-14 = 29
= 29
= 29
= 29
= 28



1 3-13 = 30
2 = 29
3 = 29
4 = 30
5 = 27

4-2 = 23
= 22
= 22
= 23
= 20

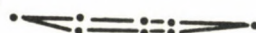


1 3-4 = 61
2 = 63
3 = 63
4 = 63
5 = 61

5-6 = 41
= 41
= 41
= 42
= 42

[b']

24



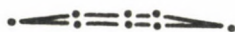
1 1-2 = 15
2 = 15
3 = 16
4 = 17
5 = 18

11-12 = 19
= 19
= 19
= 17
= 22



1 13-14 = 1
2 = 1
3 = 1
4 = 1
5 = 5

4-14 = 29
= 30
= 30
= 32
= 30



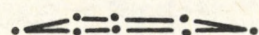
1 3-13 = 31
2 = 32
3 = 32
4 = 30
5 = 26

4-2 = 23
= 23
= 22
= 23
= 23



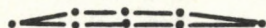
25

[b"]



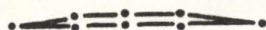
1	3-4	= 61
2		= 61
3		= 62
4		= 63
5		= 63

5-6	= 41
	= 41
	= 41
	= 41
	= 41



1	1-2	= 16
2		= 17
3		= 18
4		= 20
5		= 21

11-12	= 18
	= 19
	= 19
	= 20
	= 20



1	13-14	= 1
2		= 1
3		= 1
4		= 5
5		= 8

4-14	= 30
	= 31
	= 32
	= 30
	= 29



1	3-13	= 30
2		= 29
3		= 29
4		= 28
5		= 26

4-2	= 22
	= 23
	= 23
	= 22
	= 22



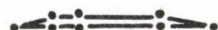
26

[p]



1	3-4	= 63
2		= 58
3		= 63
4		= 63
5		= 66

5-6	= 39
	= 39
	= 40
	= 40
	= 41



1	1-2	= 16
2		= 17
3		= 17
4		= 17
5		= 22

11-12	= 16
	= 15
	= 17
	= 17
	= 17



1	13-14	= 1
2		= 1
3		= 1
4		= 1
5		= 4

4-14	= 32
	= 32
	= 32
	= 32
	= 33



1	3-13	= 30
2		= 25
3		= 30
4		= 30
5		= 29

4-2	= 24
	= 24
	= 24
	= 24
	= 24



1 3-4 = 58
2 = 58
3 = 59
4 = 59
5 = 60

5-6 = 42
= 42
= 42
= 42
= 42

[p']

27



1 1-2 = 18
2 = 17
3 = 18
4 = 18
5 = 19

11-12 = 15
= 15
= 15
= 15
= 14



1 13-14 = 1
2 = 1
3 = 1
4 = 1
5 = 3

4-14 = 30
= 30
= 32
= 32
= 31



1 3-13 = 27
2 = 27
3 = 26
4 = 26
5 = 26

4-2 = 22
= 22
= 23
= 23
= 22



1 3-4 = 58
2 = 58
3 = 60
4 = 61
5 = 63

5-6 = 41
= 40
= 42
= 42
= 42

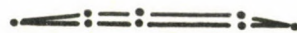
[p'']

28



1 1-2 = 16
2 = 15
3 = 18
4 = 19
5 = 22

11-12 = 16
= 22
= 16
= 15
= 21



1 13-14 = 1
2 = 1
3 = 1
4 = 3
5 = 9

4-14 = 30
= 30
= 33
= 31
= 29



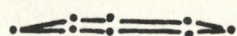
1 3-13 = 27
2 = 27
3 = 26
4 = 27
5 = 25

4-2 = 22
= 23
= 23
= 23
= 22

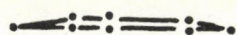


29

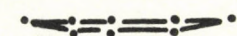
[m]



1	3 - 4 = 58	5 - 6 = 38
2	= 58	= 38
3	= 58	= 39
4	= 58	= 39
5	= 58	= 39



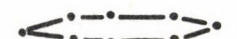
1	1 - 2 = 16	11 - 12 = 17
2	= 17	= 17
3	= 17	= 16
4	= 17	= 17
5	= 17	= 15



1	13 - 14 = 1	4 - 14 = 30
2	= 1	= 30
3	= 1	= 30
4	= 1	= 29
5	= 2	= 29



1	3 - 13 = 27	4 - 2 = 23
2	= 27	= 22
3	= 27	= 22
4	= 28	= 22
5	= 27	= 22



30

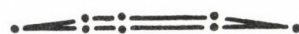
[m]



1	3 - 4 = 57	5 - 6 = 45
2	= 57	= 44
3	= 57	= 44
4	= 56	= 44
5	= 58	= 44



1	1 - 2 = 15	11 - 12 = 22
2	= 15	= 22
3	= 16	= 22
4	= 16	= 22
5	= 16	= 21



1	13 - 14 = 1	4 - 14 = 29
2	= 1	= 29
3	= 1	= 29
4	= 1	= 29
5	= 1	= 30



1	3 - 13 = 27	4 - 2 = 23
2	= 27	= 23
3	= 27	= 22
4	= 27	= 21
5	= 27	= 22

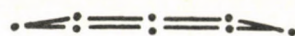


1 3-4 = 58
2 = 58
3 = 58
4 = 58
5 = 58

5-6 = 42
= 42
= 42
= 42
= 42

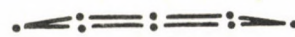
[m']

31



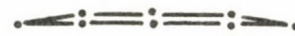
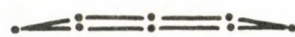
1 1-2 = 15
2 = 16
3 = 16
4 = 16
5 = 16

11-12 = 22
= 22
= 22
= 22
= 20



1 13-14 = 1
2 = 1
3 = 1
4 = 1
5 = 2

4-14 = 23
= 23
= 23
= 23
= 23



1 3-13 = 28
2 = 28
3 = 28
4 = 28
5 = 27

4-2 = 22
= 22
= 22
= 22
= 22



1 3-4 = 57
2 = 57
3 = 57
4 = 58
5 = 58

5-6 = 43
= 43
= 42
= 43
= 43

[m']

32



1 1-2 = 16
2 = 15
3 = 15
4 = 16
5 = 16

11-12 = 21
= 20
= 21
= 21
= 18



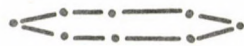
1 13-14 = 1
2 = 1
3 = 1
4 = 1
5 = 2

4-14 = 23
= 23
= 23
= 23
= 23



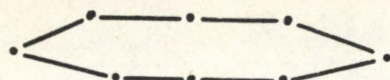
1 3-13 = 27
2 = 27
3 = 27
4 = 28
5 = 27

4-2 = 22
= 22
= 22
= 22
= 22

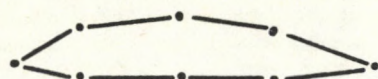


33

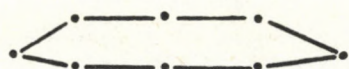
[d]



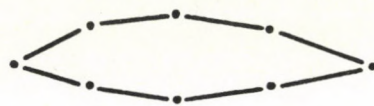
1	3-4 = 62	5-6 = 42
2	= 61	= 43
3	= 63	= 42
4	= 61	= 42
5	= 66	= 41



1	1-2 = 18	11-12 = 29
2	= 18	= 28
3	= 13	= 26
4	= 20	= 28
5	= 22	= 33



1	13-14 = 5	4-14 = 28
2	= 5	= 28
3	= 4	= 29
4	= 7	= 27
5	= 9	= 28



1	3-13 = 29	4-2 = 22
2	= 28	= 22
3	= 30	= 22
4	= 27	= 21
5	= 29	= 22

34

[d]



1	3-4 = 58	5-6 = 44
2	= 57	= 43
3	= 57	= 43
4	= 57	= 44
5	= 56	= 43



1	1-2 = 20	11-12 = 26
2	= 21	= 24
3	= 21	= 24
4	= 22	= 25
5	= 22	= 25



1	13-14 = 7	4-14 = 28
2	= 8	= 27
3	= 8	= 27
4	= 8	= 27
5	= 8	= 27



1	3-13 = 23	4-2 = 20
2	= 22	= 20
3	= 22	= 20
4	= 22	= 19
5	= 21	= 19

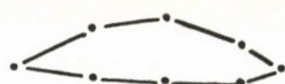


1 3-4 = 57
 2 = 57
 3 = 57
 4 = 57
 5 = 57

5-6 = 44
 = 43
 = 44
 = 45
 = 44

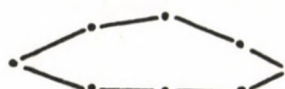
[d']

35



1 1-2 = 18
 2 = 18
 3 = 18
 4 = 18
 5 = 18

11-12 = 21
 = 22
 = 22
 = 25
 = 27



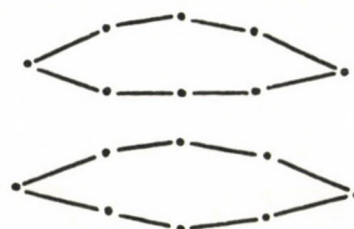
1 13-14 = 5
 2 = 6
 3 = 5
 4 = 6
 5 = 7

4-14 = 28
 = 27
 = 28
 = 27
 = 26



1 3-13 = 24
 2 = 24
 3 = 24
 4 = 24
 5 = 24

4-2 = 21
 = 21
 = 21
 = 21
 = 21

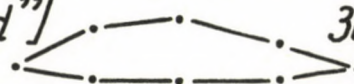


1 3-4 = 60
 2 = 60
 3 = 61
 4 = 63
 5 = 65

5-6 = 43
 = 43
 = 43
 = 43
 = 42

[d'']

36



1 1-2 = 18
 2 = 18
 3 = 21
 4 = 22
 5 = 23

11-12 = 27
 = 30
 = 29
 = 30
 = 32



1 13-14 = 5
 2 = 6
 3 = 7
 4 = 9
 5 = 10

4-14 = 28
 = 28
 = 28
 = 28
 = 28



1 3-13 = 26
 2 = 26
 3 = 26
 4 = 26
 5 = 27

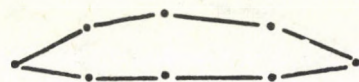
4-2 = 22
 = 22
 = 21
 = 22
 = 22



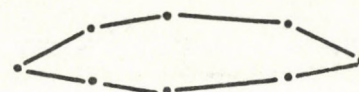
37

 $[t]$ 

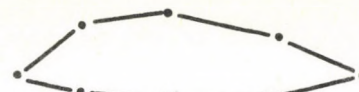
1	3-4	= 60	5-6	= 42
2		= 59		= 43
3		= 59		= 43
4		= 61		= 43
5		= 62		= 43



1	1-2	= 18	11-12	= 25
2		= 19		= 27
3		= 19		= 27
4		= 19		= 27
5		= 21		= 29



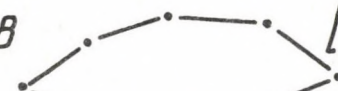
1	13-14	= 6	4-14	= 27
2		= 5		= 28
3		= 6		= 27
4		= 7		= 28
5		= 9		= 27



1	3-13	= 27	4-2	= 22
2		= 26		= 21
3		= 26		= 21
4		= 26		= 22
5		= 26		= 21



38

 $[t_o]$ 

1	3-4	= 57	5-6	= 43
2		= 57		= 43
3		= 58		= 43
4		= 58		= 43
5		= 61		= 43



1	1-2	= 20	11-12	= 27
2		= 21		= 27
3		= 24		= 27
4		= 24		= 27
5		= 25		= 28



1	13-14	= 9	4-14	= 27
2		= 10		= 26
3		= 10		= 27
4		= 10		= 27
5		= 15		= 26



1	3-13	= 21	4-2	= 21
2		= 21		= 20
3		= 21		= 20
4		= 21		= 20
5		= 20		= 21

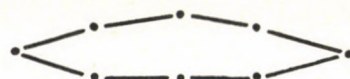


1	3-4	= 60
2		= 60
3		= 60
4		= 61
5		= 61

5-6	= 43
	= 42
	= 43
	= 43
	= 43

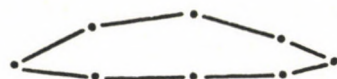
[t']

39



1	1-2	= 18
2		= 18
3		= 18
4		= 20
5		= 20

11-12	= 26
	= 25
	= 24
	= 27
	= 26



1	13-14	= 5
2		= 5
3		= 5
4		= 6
5		= 6

4-14	= 28
	= 28
	= 28
	= 28
	= 28



1	3-13	= 27
2		= 26
3		= 26
4		= 27
5		= 27

4-2	= 22
	= 22
	= 22
	= 21
	= 21

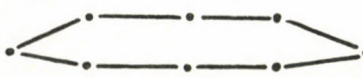


1	3-4	= 60
2		= 60
3		= 61
4		= 62
5		= 63

5-6	= 42
	= 43
	= 43
	= 43
	= 42

[t'']

40



1	1-2	= 18
2		= 20
3		= 20
4		= 22
5		= 22

11-12	= 28
	= 28
	= 32
	= 32
	= 33



1	13-14	= 4
2		= 6
3		= 6
4		= 7
5		= 8

4-14	= 29
	= 28
	= 28
	= 28
	= 27



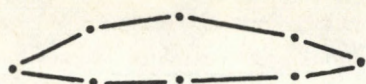
1	3-13	= 27
2		= 26
3		= 25
4		= 26
5		= 27

4-2	= 22
	= 21
	= 22
	= 21
	= 21

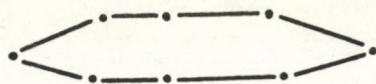


41

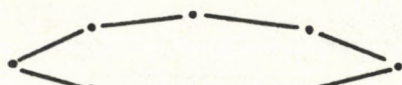
[n]



1	3 - 4 = 61	5 - 6 = 43
2	= 61	= 42
3	= 61	= 43
4	= 63	= 43
5	= 63	= 43



1	1 - 2 = 18	11 - 12 = 27
2	= 19	= 20
3	= 19	= 30
4	= 22	= 31
5	= 23	= 32



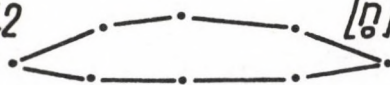
1	13 - 14 = 5	4 - 14 = 28
2	= 5	= 28
3	= 6	= 28
4	= 9	= 28
5	= 8	= 27



1	3 - 13 = 27	4 - 2 = 23
2	= 28	= 22
3	= 27	= 22
4	= 26	= 22
5	= 28	= 21

42

[n]



1	3 - 4 = 57	5 - 6 = 44
2	= 58	= 44
3	= 58	= 44
4	= 57	= 44
5	= 58	= 43



1	1 - 2 = 19	11 - 12 = 29
2	= 17	= 26
3	= 18	= 28
4	= 17	= 27
5	= 18	= 26



1	13 - 14 = 5	4 - 14 = 27
2	= 5	= 28
3	= 5	= 29
4	= 4	= 27
5	= 4	= 28



1	3 - 13 = 25	4 - 2 = 21
2	= 25	= 23
3	= 25	= 23
4	= 26	= 21
5	= 26	= 21

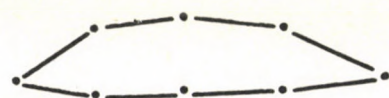


1	3-4	= 62
2		= 61
3		= 60
4		= 61
5		= 61

5-6	= 43
	= 43
	= 43
	= 43
	= 44

$[n']$

43



1	1-2	= 20
2		= 20
3		= 20
4		= 19
5		= 20

11-12	= 29
	= 28
	= 28
	= 27
	= 29



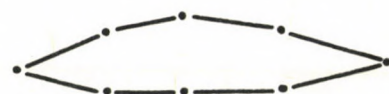
1	13-14	= 6
2		= 6
3		= 6
4		= 6
5		= 6

4-14	= 29
	= 28
	= 28
	= 28
	= 29



1	3-13	= 27
2		= 27
3		= 26
4		= 27
5		= 26

4-2	= 22
	= 21
	= 21
	= 22
	= 22



1	3-4	= 60
2		= 60
3		= 60
4		= 62
5		= 64

5-6	= 42
	= 43
	= 43
	= 42
	= 43

$[n'']$

44



1	1-2	= 20
2		= 21
3		= 21
4		= 22
5		= 24

11-12	= 26
	= 27
	= 26
	= 26
	= 29



1	13-14	= 6
2		= 7
3		= 7
4		= 9
5		= 11

4-14	= 28
	= 28
	= 27
	= 27
	= 27



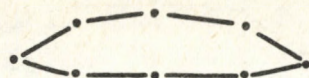
1	3-13	= 26
2		= 25
3		= 26
4		= 26
5		= 26

4-2	= 21
	= 21
	= 20
	= 21
	= 21



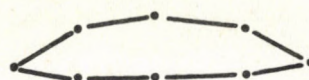
45

[n']



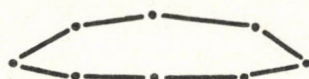
1	3-4	= 57
2		= 58
3		= 57
4		= 57
5		= 58

5-6	= 43
	= 43
	= 43
	= 43
	= 44



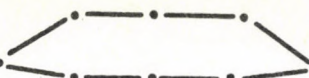
1	1-2	= 18
2		= 19
3		= 19
4		= 19
5		= 18

11-12	= 23
	= 23
	= 23
	= 25
	= 26



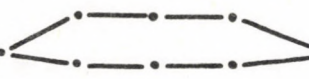
1	13-14	= 5
2		= 5
3		= 5
4		= 5
5		= 4

4-14	= 28
	= 29
	= 27
	= 27
	= 27



1	3-13	= 24
2		= 24
3		= 25
4		= 25
5		= 27

4-2	= 21
	= 21
	= 20
	= 20
	= 20



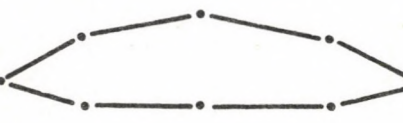
46

[h]



1	3-4	= 62
2		= 63
3		= 62
4		= 61
5		= 61

5-6	= 41
	= 42
	= 42
	= 41
	= 42



1	1-2	= 21
2		= 21
3		= 22
4		= 20
5		= 21

11-12	= 33
	= 36
	= 35
	= 35
	= 32



1	13-14	= 8
2		= 8
3		= 8
4		= 7
5		= 6

4-14	= 28
	= 29
	= 29
	= 28
	= 29



1	3-13	= 25
2		= 26
3		= 25
4		= 26
5		= 26

4-2	= 21
	= 22
	= 21
	= 21
	= 21



1	3-4	= 61
2		= 62
3		= 61
4		= 61
5		= 62

5-6	= 41
	= 41
	= 42
	= 41
	= 42

[h']

47



1	1-2	= 20
2		= 19
3		= 19
4		= 19
5		= 20

11-12	= 20
	= 21
	= 22
	= 21
	= 21



1	13-14	= 5
2		= 5
3		= 5
4		= 5
5		= 5

4-14	= 30
	= 31
	= 30
	= 30
	= 30



1	3-13	= 26
2		= 26
3		= 26
4		= 26
5		= 27

4-2	= 22
	= 23
	= 22
	= 22
	= 22



1	3-4	= 62
2		= 62
3		= 61
4		= 63
5		= 64

5-6	= 43
	= 41
	= 43
	= 42
	= 43

[g]

48



1	1-2	= 21
2		= 21
3		= 21
4		= 23
5		= 23

11-12	= 33
	= 32
	= 36
	= 34
	= 35



1	13-14	= 7
2		= 8
3		= 8
4		= 9
5		= 9

4-14	= 28
	= 28
	= 28
	= 27
	= 29

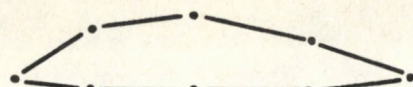


1	3-13	= 26
2		= 25
3		= 25
4		= 27
5		= 26

4-2	= 21
	= 21
	= 21
	= 20
	= 22

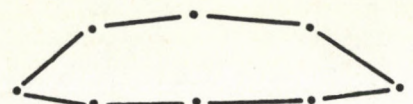


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 $[g']$ 

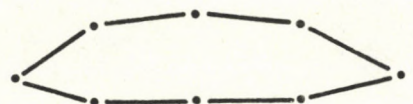
$$\begin{array}{rcl}
 1 & 3-4 & = 62 \\
 2 & & = 62 \\
 3 & & = 62 \\
 4 & & = 62 \\
 5 & & = 62
 \end{array}$$

$$\begin{array}{rcl}
 5-6 & = & 42 \\
 & = & 43 \\
 & = & 43 \\
 & = & 43 \\
 & = & 43
 \end{array}$$



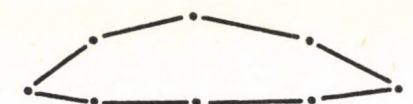
$$\begin{array}{rcl}
 1 & 1-2 & = 19 \\
 2 & & = 20 \\
 3 & & = 19 \\
 4 & & = 19 \\
 5 & & = 20
 \end{array}$$

$$\begin{array}{rcl}
 11-12 & = & 31 \\
 & = & 30 \\
 & = & 30 \\
 & = & 29 \\
 & = & 30
 \end{array}$$



$$\begin{array}{rcl}
 1 & 13-14 & = 6 \\
 2 & & = 7 \\
 3 & & = 7 \\
 4 & & = 7 \\
 5 & & = 7
 \end{array}$$

$$\begin{array}{rcl}
 4-14 & = & 30 \\
 & = & 29 \\
 & = & 29 \\
 & = & 30 \\
 & = & 29
 \end{array}$$



$$\begin{array}{rcl}
 1 & 3-13 & = 26 \\
 2 & & = 26 \\
 3 & & = 26 \\
 4 & & = 25 \\
 5 & & = 26
 \end{array}$$

$$\begin{array}{rcl}
 4-2 & = & 23 \\
 & = & 22 \\
 & = & 23 \\
 & = & 23 \\
 & = & 22
 \end{array}$$



50

 $[g']$ 

$$\begin{array}{rcl}
 1 & 3-4 & = 62 \\
 2 & & = 62 \\
 3 & & = 62 \\
 4 & & = 61 \\
 5 & & = 61
 \end{array}$$

$$\begin{array}{rcl}
 5-6 & = & 42 \\
 & = & 41 \\
 & = & 43 \\
 & = & 43 \\
 & = & 43
 \end{array}$$



$$\begin{array}{rcl}
 1 & 1-2 & = 21 \\
 2 & & = 22 \\
 3 & & = 21 \\
 4 & & = 21 \\
 5 & & = 20
 \end{array}$$

$$\begin{array}{rcl}
 11-12 & = & 34 \\
 & = & 34 \\
 & = & 32 \\
 & = & 33 \\
 & = & 33
 \end{array}$$



$$\begin{array}{rcl}
 1 & 13-14 & = 9 \\
 2 & & = 8 \\
 3 & & = 8 \\
 4 & & = 8 \\
 5 & & = 7
 \end{array}$$

$$\begin{array}{rcl}
 4-14 & = & 27 \\
 & = & 28 \\
 & = & 28 \\
 & = & 27 \\
 & = & 26
 \end{array}$$



$$\begin{array}{rcl}
 1 & 3-13 & = 26 \\
 2 & & = 26 \\
 3 & & = 26 \\
 4 & & = 25 \\
 5 & & = 26
 \end{array}$$

$$\begin{array}{rcl}
 4-2 & = & 21 \\
 & = & 22 \\
 & = & 22 \\
 & = & 21 \\
 & = & 22
 \end{array}$$



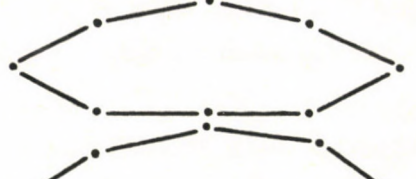
1 3-4 = 64
2 = 66
3 = 65
4 = 66
5 = 67

5-6 = 41
= 41
= 42
= 42
= 41



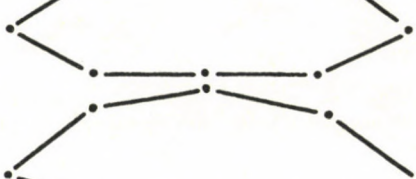
1 1-2 = 24
2 = 26
3 = 25
4 = 25
5 = 26

11-12 = 35
= 34
= 35
= 36
= 36



1 13-14 = 10
2 = 10
3 = 11
4 = 11
5 = 13

4-14 = 28
= 29
= 28
= 29
= 28



1 3-13 = 26
2 = 27
3 = 26
4 = 26
5 = 26

4-2 = 21
= 21
= 21
= 22
= 22



1 3-4 = 61
2 = 62
3 = 61
4 = 62
5 = 62

5-6 = 42
= 42
= 42
= 42
= 42



1 1-2 = 20
2 = 21
3 = 20
4 = 21
5 = 21

11-12 = 28
= 29
= 28
= 31
= 31



1 13-14 = 8
2 = 7
3 = 7
4 = 8
5 = 8

4-14 = 28
= 29
= 29
= 29
= 29

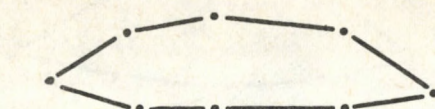


1 3-13 = 25
2 = 26
3 = 25
4 = 25
5 = 25

4-2 = 22
= 22
= 22
= 22
= 22

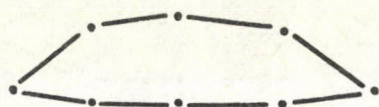


53

 $[k'']$ 

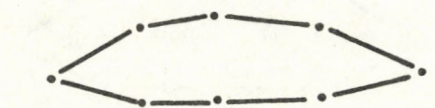
$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 3-4 = 61 \\ = 62 \\ = 62 \\ = 62 \\ = 63 \end{array}$$

$$\begin{array}{l} 5-6 = 42 \\ = 42 \\ = 42 \\ = 42 \\ = 42 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 1-2 = 20 \\ = 21 \\ = 21 \\ = 22 \\ = 22 \end{array}$$

$$\begin{array}{l} 11-12 = 30 \\ = 28 \\ = 29 \\ = 32 \\ = 33 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 13-14 = 7 \\ = 7 \\ = 7 \\ = 9 \\ = 9 \end{array}$$

$$\begin{array}{l} 4-14 = 29 \\ = 29 \\ = 30 \\ = 27 \\ = 29 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 3-13 = 25 \\ = 26 \\ = 25 \\ = 26 \\ = 25 \end{array}$$

$$\begin{array}{l} 4-2 = 22 \\ = 22 \\ = 22 \\ = 21 \\ = 22 \end{array}$$

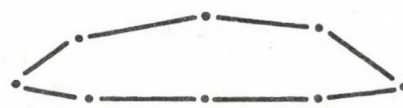


54

 $[r]$ 

$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 3-4 = 62 \\ = 63 \\ = 62 \\ = 63 \\ = 64 \end{array}$$

$$\begin{array}{l} 5-6 = 41 \\ = 42 \\ = 42 \\ = 41 \\ = 41 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 1-2 = 21 \\ = 21 \\ = 23 \\ = 22 \\ = 24 \end{array}$$

$$\begin{array}{l} 11-12 = 32 \\ = 32 \\ = 32 \\ = 31 \\ = 35 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 13-14 = 7 \\ = 7 \\ = 8 \\ = 8 \\ = 11 \end{array}$$

$$\begin{array}{l} 4-14 = 29 \\ = 29 \\ = 29 \\ = 29 \\ = 28 \end{array}$$



$$\begin{array}{l} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \quad \begin{array}{l} 3-13 = 26 \\ = 27 \\ = 25 \\ = 26 \\ = 25 \end{array}$$

$$\begin{array}{l} 4-2 = 22 \\ = 22 \\ = 21 \\ = 22 \\ = 21 \end{array}$$

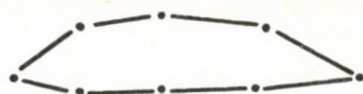


1	3-4	= 60
2		= 59
3		= 59
4		= 59
5		= 59

5-6	= 43
	= 43
	= 43
	= 43
	= 43

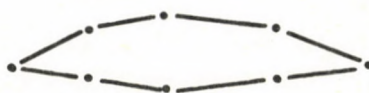
σ

55



1	1-2	= 20
2		= 20
3		= 20
4		= 19
5		= 19

11-12	= 27
	= 28
	= 28
	= 28
	= 28



1	13-14	= 6
2		= 6
3		= 6
4		= 6
5		= 6

4-14	= 29
	= 27
	= 27
	= 27
	= 27



1	3-13	= 25
2		= 26
3		= 26
4		= 26
5		= 26

4-2	= 21
	= 20
	= 20
	= 21
	= 21



1	3-4	= 62
2		= 62
3		= 62
4		= 62
5		= 62

5-6	= 42
	= 42
	= 43
	= 41
	= 42

$[r']$

56



1	1-2	= 21
2		= 21
3		= 21
4		= 21
5		= 22

11-12	= 27
	= 27
	= 28
	= 29
	= 29



1	13-14	= 7
2		= 6
3		= 6
4		= 7
5		= 8

4-14	= 29
	= 30
	= 30
	= 29
	= 28

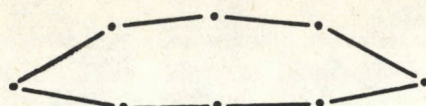


1	3-13	= 26
2		= 26
3		= 26
4		= 26
5		= 26

4-2	= 22
	= 22
	= 22
	= 22
	= 21

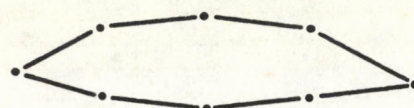


57

 $[r'']$ 

1	2 - 4 =	64
2	=	64
3	=	64
4	=	64
5	=	63

5 - 6 =	41
=	42
=	42
=	43
=	41



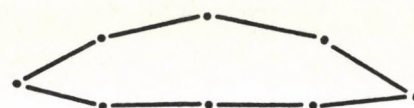
1	1 - 2 =	22
2	=	22
3	=	22
4	=	21
5	=	22

11 - 12 =	35
=	34
=	34
=	34
=	32



1	13 - 14 =	8
2	=	8
3	=	8
4	=	8
5	=	7

4 - 14 =	29
=	29
=	29
=	30
=	30



1	3 - 13 =	27
2	=	27
3	=	27
4	=	26
5	=	26

4 - 2 =	22
=	22
=	22
=	23
=	22



58

 $[r']$ 

1	3 - 4 =	60
2	=	61
3	=	59
4	=	61
5	=	60

5 - 6 =	43
=	44
=	43
=	42
=	43



1	1 - 2 =	20
2	=	20
3	=	20
4	=	20
5	=	20

11 - 12 =	30
=	30
=	29
=	29
=	29



1	13 - 14 =	7
2	=	7
3	=	7
4	=	7
5	=	6

4 - 14 =	27
=	28
=	28
=	28
=	28



1	3 - 13 =	26
2	=	26
3	=	24
4	=	25
5	=	25

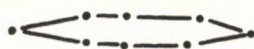
4 - 2 =	21
=	21
=	21
=	22
=	22



[v]

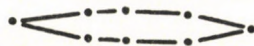
1	3-4	= 60
2		= 60
3		= 61
4		= 60
5		= 61

5-6	= 41
	= 42
	= 42
	= 42
	= 42



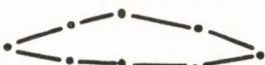
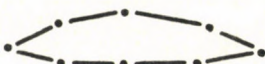
1	1-2	= 16
2		= 16
3		= 17
4		= 16
5		= 17

11-12	= 19
	= 19
	= 20
	= 20
	= 20



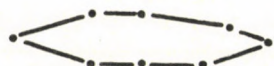
1	13-14	= 2
2		= 2
3		= 4
4		= 4
5		= 4

4-14	= 31
	= 31
	= 31
	= 31
	= 31



1	3-13	= 27
2		= 27
3		= 26
4		= 25
5		= 26

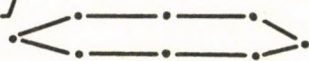
4-2	= 25
	= 25
	= 25
	= 25
	= 25



1	3-4	= 59
2		= 59
3		= 59
4		= 59
5		= 59

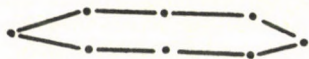
5-6	= 43
	= 43
	= 43
	= 42
	= 43

[v']



1	1-2	= 18
2		= 18
3		= 18
4		= 19
5		= 19

11-12	= 23
	= 23
	= 19
	= 19
	= 19



1	13-14	= 3
2		= 3
3		= 3
4		= 5
5		= 4

4-14	= 30
	= 30
	= 31
	= 30
	= 30



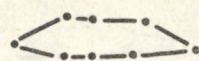
1	3-13	= 26
2		= 26
3		= 25
4		= 24
5		= 25

4-2	= 23
	= 23
	= 23
	= 23
	= 23

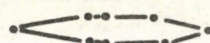


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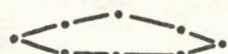
[v"]



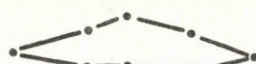
1	3 - 4 = 60	5 - 6 = 43
2	= 59	= 43
3	= 58	= 42
4	= 58	= 43
5	= 60	= 42



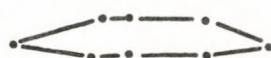
1	1 - 2 = 17	11 - 12 = 14
2	= 18	= 15
3	= 18	= 16
4	= 19	= 19
5	= 19	= 20



1	13 - 14 = 3	4 - 14 = 31
2	= 2	= 31
3	= 3	= 30
4	= 4	= 30
5	= 3	= 31

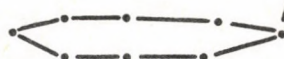


1	3 - 13 = 26	4 - 2 = 24
2	= 26	= 23
3	= 25	= 23
4	= 24	= 22
5	= 26	= 23



62

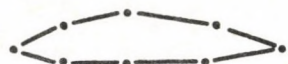
[f]



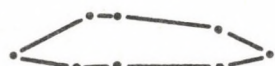
1	3 - 4 = 58	5 - 6 = 42
2	= 59	= 43
3	= 59	= 43
4	= 59	= 43
5	= 59	= 43



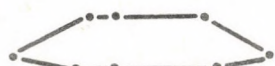
1	1 - 2 = 18	11 - 12 = 21
2	= 18	= 22
3	= 18	= 21
4	= 19	= 20
5	= 18	= 20



1	13 - 14 = 3	4 - 14 = 28
2	= 4	= 30
3	= 4	= 30
4	= 4	= 30
5	= 4	= 30



1	3 - 13 = 27	4 - 2 = 22
2	= 25	= 23
3	= 25	= 23
4	= 25	= 23
5	= 25	= 24

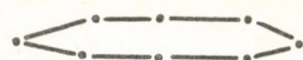


1	3-4	= 56
2		= 55
3		= 57
4		= 57
5		= 57

5-6	= 43
	= 43
	= 43
	= 43
	= 43

[f']

63



1	1-2	= 16
2		= 16
3		= 17
4		= 18
5		= 19

11-12	= 22
	= 22
	= 23
	= 21
	= 20



1	13-14	= 3
2		= 4
3		= 4
4		= 4
5		= 4

4-14	= 28
	= 28
	= 29
	= 28
	= 28



1	3-13	= 25
2		= 23
3		= 24
4		= 25
5		= 25

4-2	= 22
	= 22
	= 22
	= 21
	= 21

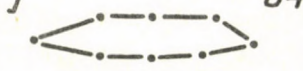


1	3-4	= 58
2		= 58
3		= 60
4		= 60
5		= 60

5-6	= 43
	= 43
	= 43
	= 43
	= 43

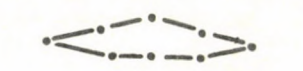
[f'']

64



1	1-2	= 18
2		= 18
3		= 19
4		= 18
5		= 19

11-12	= 17
	= 16
	= 15
	= 17
	= 19



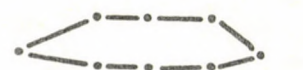
1	13-14	= 3
2		= 3
3		= 3
4		= 3
5		= 4

4-14	= 30
	= 30
	= 31
	= 30
	= 30



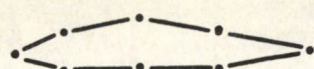
1	3-13	= 26
2		= 26
3		= 26
4		= 27
5		= 26

4-2	= 23
	= 23
	= 23
	= 23
	= 23



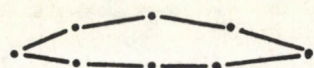
65

[z]



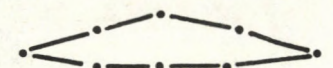
1	3-4	= 59
2		= 59
3		= 59
4		= 59
5		= 59

5-6	= 43
	= 43
	= 43
	= 43
	= 43



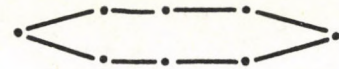
1	1-2	= 18
2		= 18
3		= 18
4		= 18
5		= 19

11-12	= 23
	= 23
	= 23
	= 23
	= 25
	= 24



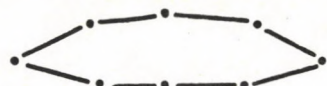
1	13-14	= 4
2		= 4
3		= 4
4		= 4
5		= 6

4-14	= 29
	= 29
	= 29
	= 28
	= 27



1	3-13	= 26
2		= 26
3		= 26
4		= 27
5		= 26

4-2	= 22
	= 22
	= 22
	= 22
	= 21



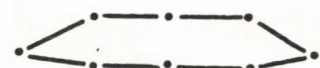
66

[z']



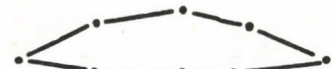
1	3-4	= 59
2		= 60
3		= 61
4		= 59
5		= 59

5-6	= 43
	= 41
	= 42
	= 42
	= 43



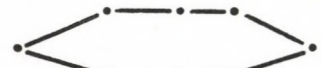
1	1-2	= 19
2		= 19
3		= 18
4		= 18
5		= 21

11-12	= 24
	= 23
	= 24
	= 23
	= 28



1	13-14	= 5
2		= 4
3		= 5
4		= 5
5		= 6

4-14	= 27
	= 29
	= 31
	= 28
	= 28



1	3-13	= 27
2		= 27
3		= 25
4		= 26
5		= 25

4-2	= 21
	= 22
	= 24
	= 22
	= 21

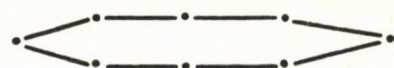


1	3-4	= 58
2		= 60
3		= 60
4		= 60
5		= 60

5-6	= 42
	= 42
	= 43
	= 42
	= 43

[s]

67



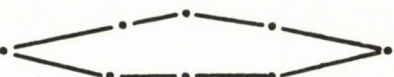
1	1-2	= 18
2		= 18
3		= 18
4		= 17
5		= 18

11-12	= 29
	= 29
	= 30
	= 29
	= 27



1	13-14	= 4
2		= 5
3		= 5
4		= 5
5		= 6

4-14	= 28
	= 29
	= 29
	= 29
	= 28



1	3-13	= 27
2		= 26
3		= 26
4		= 26
5		= 26

4-2	= 21
	= 22
	= 23
	= 23
	= 22

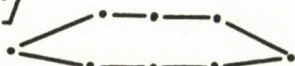


1	3-4	= 60
2		= 60
3		= 59
4		= 59
5		= 60

5-6	= 42
	= 43
	= 43
	= 44
	= 43

[s']

68



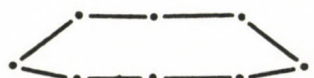
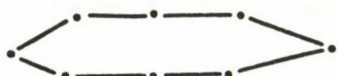
1	1-2	= 18
2		= 20
3		= 20
4		= 19
5		= 20

11-12	= 22
	= 26
	= 25
	= 23
	= 24



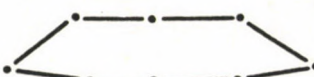
1	13-14	= 4
2		= 6
3		= 5
4		= 5
5		= 5

4-14	= 23
	= 28
	= 28
	= 28
	= 28

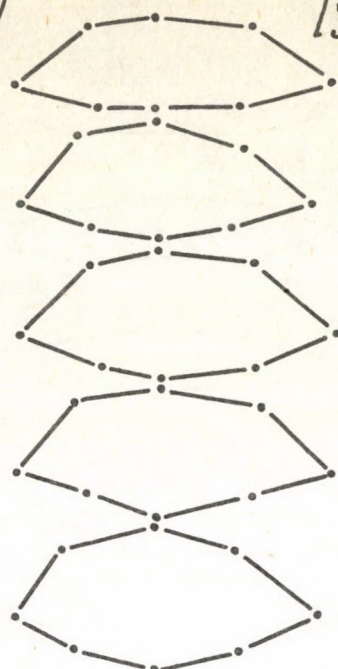


1	3-13	= 27
2		= 26
3		= 26
4		= 26
5		= 27

4-2	= 22
	= 21
	= 21
	= 21
	= 21



69



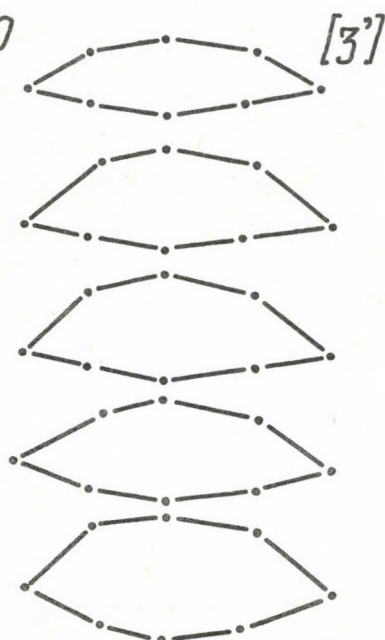
1	3-4 = 61	5-6 = 42
2	= 60	= 42
3	= 60	= 42
4	= 60	= 41
5	= 61	= 41

1	1-2 = 21	11-12 = 27
2	= 23	= 25
3	= 24	= 27
4	= 24	= 27
5	= 25	= 26

1	13-14 = 8	4-14 = 29
2	= 10	= 28
3	= 11	= 27
4	= 12	= 27
5	= 13	= 26

1	3-13 = 24	4-2 = 22
2	= 22	= 21
3	= 22	= 20
4	= 21	= 20
5	= 22	= 20

70



1	3-4 = 60	5-6 = 41
2	= 60	= 41
3	= 60	= 41
4	= 60	= 42
5	= 60	= 41

1	1-2 = 21	11-12 = 23
2	= 21	= 24
3	= 22	= 24
4	= 22	= 25
5	= 24	= 24

1	13-14 = 6	4-14 = 28
2	= 8	= 28
3	= 8	= 29
4	= 8	= 29
5	= 10	= 27

1	3-13 = 26	4-2 = 21
2	= 24	= 21
3	= 23	= 21
4	= 23	= 21
5	= 23	= 19

1	3-4	= 60
2		= 60
3		= 60
4		= 60
5		= 62

5-6	= 43
	= 42
	= 42
	= 42
	= 42

[7p]

71

1	1-2	= 21
2		= 23
3		= 23
4		= 23
5		= 24

11-12	= 25
	= 25
	= 26
	= 26
	= 26

1	13-14	= 8
2		= 8
3		= 9
4		= 11
5		= 10

4-14	= 29
	= 29
	= 28
	= 26
	= 28

1	3-13	= 23
2		= 23
3		= 23
4		= 23
5		= 24

4-2	= 22
	= 21
	= 21
	= 20
	= 21

1	3-4	= 61
2		= 60
3		= 61
4		= 61
5		= 62

5-6	= 42
	= 42
	= 42
	= 42
	= 42

[7j]

72

1	1-2	= 22
2		= 23
3		= 24
4		= 24
5		= 24

11-12	= 27
	= 25
	= 26
	= 27
	= 27

1	13-14	= 7
2		= 9
3		= 10
4		= 10
5		= 12

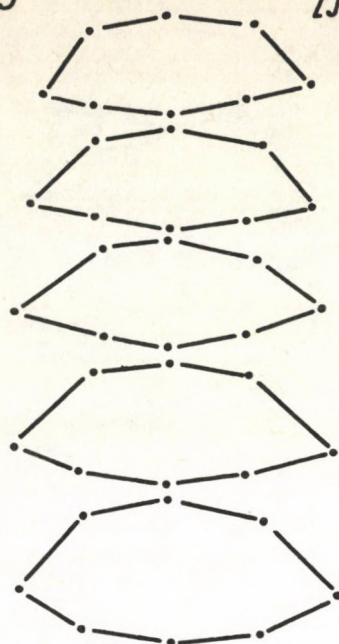
4-14	= 29
	= 27
	= 28
	= 28
	= 27

1	3-13	= 25
2		= 24
3		= 23
4		= 23
5		= 23

4-2	= 21
	= 20
	= 20
	= 20
	= 20

73

[j']



1	3-4	= 58	5-6	= 41
2		= 58		= 41
3		= 58		= 41
4		= 58		= 42
5		= 59		= 41

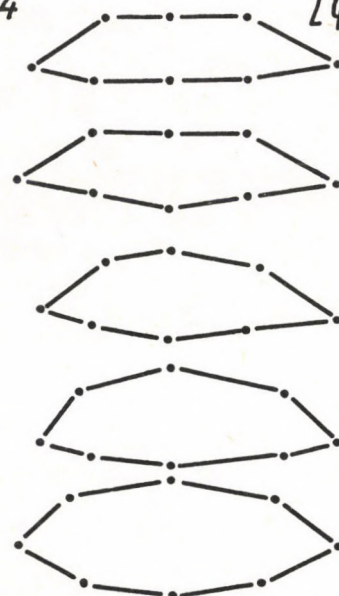
1	1-2	= 23	11-12	= 21
2		= 22		= 22
3		= 24		= 24
4		= 24		= 25
5		= 24		= 25

1	13-14	= 8	4-14	= 28
2		= 7		= 28
3		= 9		= 28
4		= 10		= 27
5		= 11		= 27

1	3-13	= 22	4-2	= 20
2		= 23		= 20
3		= 21		= 19
4		= 21		= 19
5		= 21		= 20

74

[φ]



1	3-4	= 60	5-6	= 41
2		= 60		= 41
3		= 60		= 42
4		= 60		= 42
5		= 62		= 42

1	1-2	= 20	11-12	= 24
2		= 21		= 25
3		= 21		= 23
4		= 20		= 23
5		= 23		= 25

1	13-14	= 5	4-14	= 28
2		= 6		= 28
3		= 7		= 28
4		= 8		= 27
5		= 10		= 28

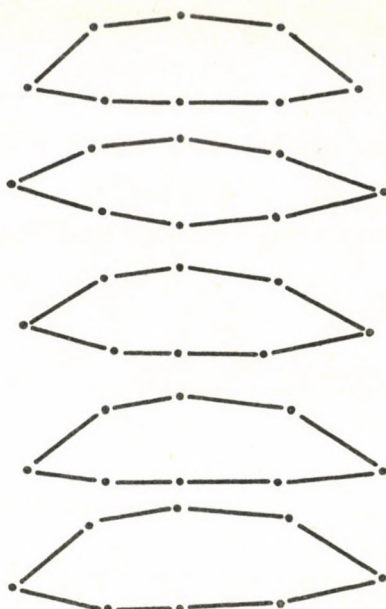
1	3-13	= 26	4-2	= 21
2		= 26		= 21
3		= 25		= 21
4		= 25		= 21
5		= 24		= 21

1 3-4 = 61
2 = 61
3 = 61
4 = 62
5 = 62

5-6 = 42
= 43
= 41
= 42
= 42

[j]

75



1 1-2 = 21
2 = 20
3 = 22
4 = 22
5 = 22

11-12 = 26
= 29
= 27
= 28
= 29

1 13-14 = 7
2 = 7
3 = 7
4 = 7
5 = 8

4-14 = 29
= 28
= 28
= 29
= 29

1 3-13 = 25
2 = 26
3 = 26
4 = 26
5 = 25

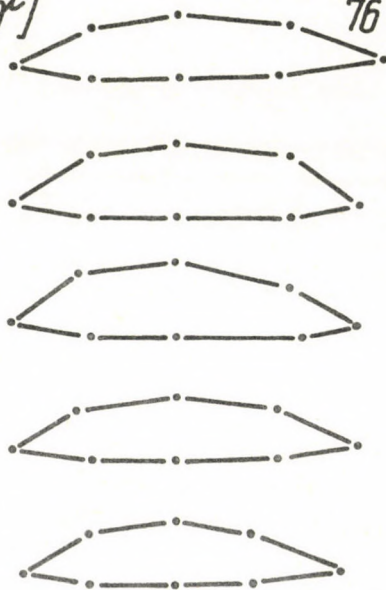
4-2 = 21
= 22
= 20
= 21
= 22

1 3-4 = 53
2 = 53
3 = 60
4 = 60
5 = 53

5-6 = 41
= 41
= 41
= 41
= 43

[x]

76



1 1-2 = 20
2 = 19
3 = 19
4 = 18
5 = 20

11-12 = 29
= 27
= 27
= 27
= 25

1 13-14 = 5
2 = 6
3 = 6
4 = 5
5 = 5

4-14 = 29
= 28
= 29
= 29
= 29

1 3-13 = 25
2 = 24
3 = 25
4 = 26
5 = 25

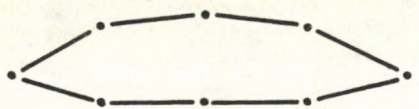
4-2 = 21
= 22
= 23
= 23
= 21

77

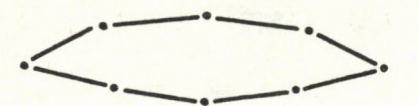
[x]



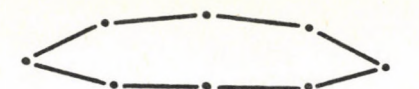
1	3-4 = 61	5-6 = 42
2	= 61	= 42
3	= 59	= 42
4	= 59	= 42
5	= 60	= 44



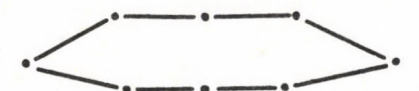
1	1-2 = 21	11-12 = 32
2	= 21	= 31
3	= 21	= 28
4	= 20	= 28
5	= 20	= 28



1	13-14 = 8	4-14 = 28
2	= 7	= 29
3	= 7	= 27
4	= 6	= 28
5	= 6	= 29

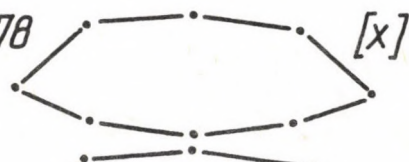


1	3-13 = 25	4-2 = 22
2	= 25	= 22
3	= 25	= 20
4	= 25	= 21
5	= 25	= 21



78

[x]



1	3-4 = 67	5-6 = 40
2	= 67	= 41
3	= 67	= 41
4	= 67	= 42
5	= 67	= 42



1	1-2 = 28	11-12 = 32
2	= 28	= 34
3	= 28	= 34
4	= 28	= 34
5	= 28	= 33



1	13-14 = 12	4-14 = 28
2	= 12	= 28
3	= 13	= 27
4	= 13	= 27
5	= 12	= 27



1	3-13 = 27	4-2 = 20
2	= 27	= 20
3	= 27	= 20
4	= 27	= 20
5	= 28	= 20



1 3-4 = 62
2 = 61
3 = 61
4 = 62
5 = 61

5-6 = 43
= 43
= 43
= 42
= 42

[ch']

79



1 1-2 = 22
2 = 21
3 = 21
4 = 21
5 = 22

11-12 = 30
= 28
= 30
= 30
= 27



1 13-14 = 7
2 = 7
3 = 7
4 = 8
5 = 8

4-14 = 28
= 28
= 28
= 28
= 27



1 3-13 = 27
2 = 26
3 = 26
4 = 26
5 = 26

4-2 = 21
= 21
= 21
= 22
= 20



[ch]

80

1 3-4 = 66
2 = 66
3 = 66
4 = 67
5 = 67

5-6 = 42
= 42
= 42
= 41
= 41



1 1-2 = 24
2 = 24
3 = 25
4 = 25
5 = 25

11-12 = 31
= 30
= 31
= 31
= 31



1 13-14 = 8
2 = 10
3 = 11
4 = 10
5 = 11

4-14 = 28
= 29
= 29
= 30
= 29



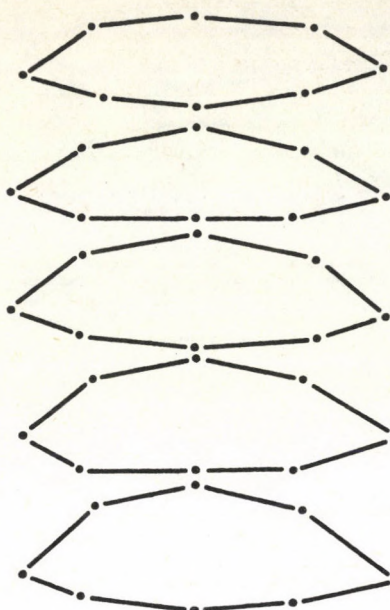
1 3-13 = 29
2 = 27
3 = 26
4 = 27
5 = 27

4-2 = 22
= 23
= 22
= 23
= 23



81

[1]



1	3 - 4 = 65	5 - 6 = 41
2	= 64	= 41
3	= 65	= 42
4	= 66	= 42
5	= 66	= 42

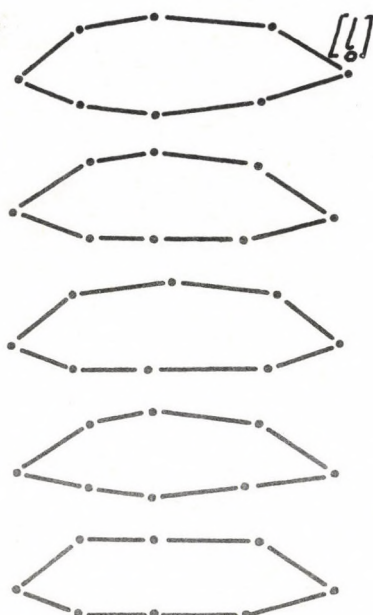
1	1 - 2 = 23	11 - 12 = 31
2	= 22	= 32
3	= 24	= 32
4	= 25	= 32
5	= 24	= 32

1	13 - 14 = 8	4 - 14 = 30
2	= 8	= 30
3	= 10	= 29
4	= 10	= 30
5	= 11	= 30

1	3 - 13 = 27	4 - 2 = 23
2	= 26	= 23
3	= 26	= 22
4	= 26	= 22
5	= 25	= 23

82

[1]



1	3 - 4 = 60	5 - 6 = 43
2	= 60	= 42
3	= 60	= 42
4	= 59	= 42
5	= 61	= 42

1	1 - 2 = 21	11 - 12 = 26
2	= 21	= 25
3	= 21	= 26
4	= 21	= 25
5	= 21	= 25

1	13 - 14 = 8	4 - 14 = 28
2	= 7	= 29
3	= 7	= 28
4	= 7	= 27
5	= 6	= 28

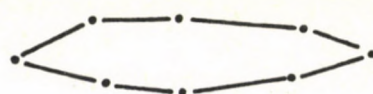
1	3 - 13 = 24	4 - 2 = 21
2	= 24	= 21
3	= 25	= 21
4	= 25	= 20
5	= 26	= 22

1 3-4 = 62
2 = 62
3 = 62
4 = 61
5 = 61

5-6 = 41
= 42
= 42
= 43
= 42

[l']

83



1 1-2 = 21
2 = 21
3 = 21
4 = 21
5 = 21

11-12 = 28
= 27
= 29
= 29
= 30



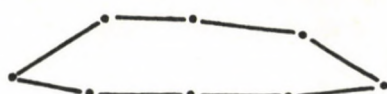
1 13-14 = 6
2 = 6
3 = 6
4 = 6
5 = 7

4-14 = 29
= 30
= 30
= 29
= 28



1 3-13 = 27
2 = 26
3 = 26
4 = 26
5 = 26

4-2 = 22
= 22
= 22
= 21
= 21



1 3-4 = 59
2 = 59
3 = 59
4 = 59
5 = 59

5-6 = 43
= 43
= 44
= 43
= 43

[dz]

84



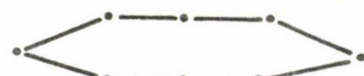
1 1-2 = 19
2 = 19
3 = 20
4 = 19
5 = 19

11-12 = 25
= 25
= 27
= 23
= 23



1 13-14 = 5
2 = 4
3 = 5
4 = 4
5 = 4

4-14 = 29
= 29
= 29
= 29
= 29



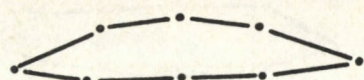
1 3-13 = 25
2 = 26
3 = 26
4 = 26
5 = 26

4-2 = 22
= 22
= 21
= 22
= 22

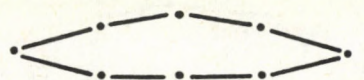


85

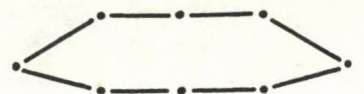
[ts]



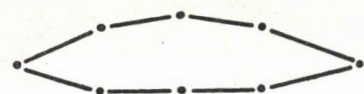
1	3-4 = 53	5-6 = 43
2	= 53	= 43
3	= 53	= 43
4	= 53	= 43
5	= 60	= 42



1	1-2 = 19	11-12 = 27
2	= 19	= 26
3	= 19	= 26
4	= 19	= 27
5	= 20	= 27



1	13-14 = 5	4-14 = 28
2	= 5	= 28
3	= 6	= 27
4	= 6	= 28
5	= 7	= 27

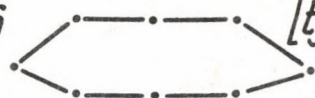


1	3-13 = 26	4-2 = 21
2	= 26	= 22
3	= 25	= 21
4	= 25	= 21
5	= 26	= 21



86

[ts']



1	3-4 = 53	5-6 = 43
2	= 53	= 43
3	= 53	= 43
4	= 61	= 43
5	= 61	= 43



1	1-2 = 21	11-12 = 23
2	= 21	= 23
3	= 20	= 23
4	= 21	= 24
5	= 20	= 26



1	13-14 = 6	4-14 = 27
2	= 6	= 28
3	= 7	= 28
4	= 8	= 28
5	= 8	= 28



1	3-13 = 26	4-2 = 20
2	= 25	= 20
3	= 24	= 21
4	= 25	= 22
5	= 24	= 23



1 3-4 = 57
2 = 56
3 = 57
4 = 58
5 = 58

5-6 = 43
= 43
= 43
= 42
= 41

$[d_3]$

87



1 1-2 = 20
2 = 21
3 = 21
4 = 21
5 = 24

11-12 = 24
= 24
= 24
= 24
= 22



1 13-14 = 7
2 = 8
3 = 9
4 = 9
5 = 9

4-14 = 27
= 27
= 26
= 27
= 28



1 3-13 = 23
2 = 21
3 = 22
4 = 22
5 = 21

4-2 = 20
= 20
= 20
= 21
= 19



1 3-4 = 58
2 = 59
3 = 58
4 = 58
5 = 58

5-6 = 43
= 43
= 42
= 43
= 42

$[d_3']$

88



1 1-2 = 20
2 = 20
3 = 20
4 = 20
5 = 20

11-12 = 26
= 27
= 26
= 25
= 26



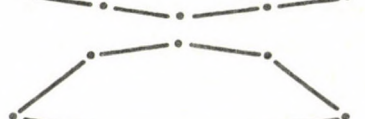
1 13-14 = 6
2 = 6
3 = 7
4 = 8
5 = 8

4-14 = 28
= 29
= 29
= 27
= 28



1 3-13 = 24
2 = 24
3 = 23
4 = 23
5 = 23

4-2 = 21
= 22
= 22
= 21
= 22

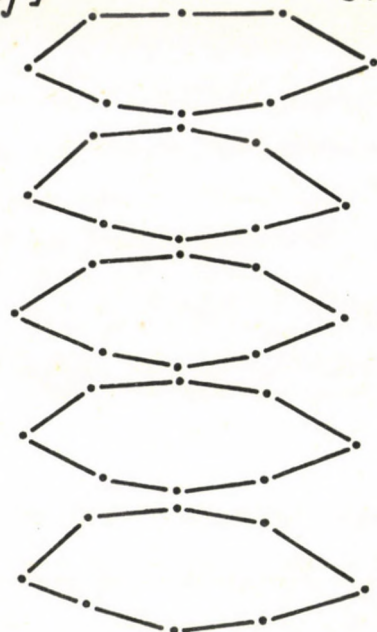


1	3-4	= 58
2		= 58
3		= 58
4		= 58
5		= 58

5-6	= 43
	= 43
	= 43
	= 43
	= 43

$[t_j]$

91



1	1-2	= 21
2		= 22
3		= 22
4		= 22
5		= 22

11-12	= 27
	= 25
	= 26
	= 26
	= 27

1	13-14	= 8
2		= 9
3		= 9
4		= 9
5		= 10

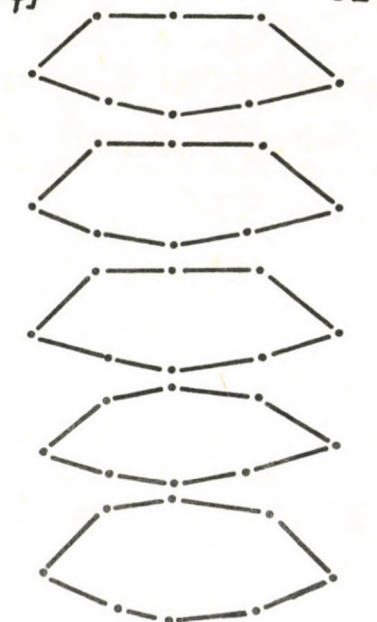
4-14	= 26
	= 28
	= 27
	= 27
	= 26

1	3-13	= 24
2		= 22
3		= 23
4		= 23
5		= 22

4-2	= 20
	= 21
	= 20
	= 20
	= 20

$[t_6]$

92



1	3-4	= 58
2		= 58
3		= 58
4		= 58
5		= 58

5-6	= 42
	= 42
	= 42
	= 42
	= 43

1	1-2	= 22
2		= 22
3		= 22
4		= 22
5		= 23

11-12	= 24
	= 24
	= 24
	= 23
	= 23

1	13-14	= 8
2		= 8
3		= 8
4		= 8
5		= 10

4-14	= 26
	= 26
	= 26
	= 27
	= 26

1	3-13	= 24
2		= 24
3		= 24
4		= 23
5		= 22

4-2	= 19
	= 19
	= 19
	= 19
	= 19

CINERADIOGRAPHIC DATA OF MEASUREMENT FOR POLISH SPEECH

SOUNDS

DANE KINORENTGENOGRAFICZNE GŁOSEK POLSKICH

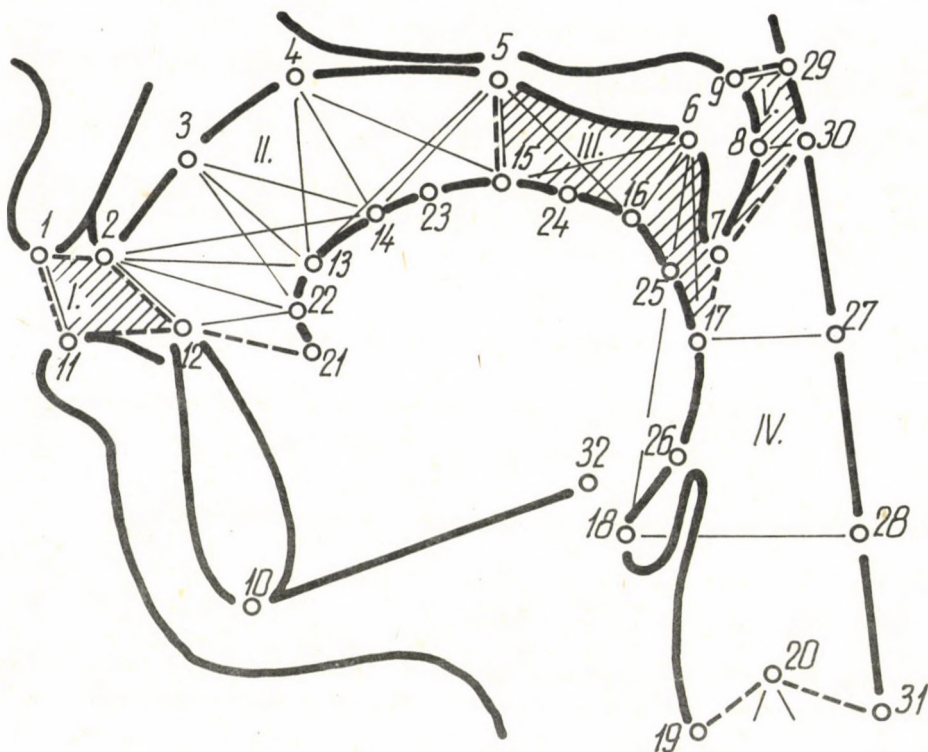


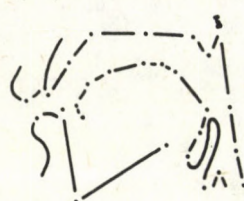
Figure 2

This schematic radiogram contour indicates the location of measurement points for the investigation of articulatory processes in the vocal tract. The pairs of points linked by solid lines represent the measurement relations for which distance values are given in the tables (pp. 259--352). The areas marked I--V correspond to those sections of the vocal tract (labial, palatal, velar, pharyngeal, and nasal regions) for which area parameters are given in the tables on pp. 359--374 in relative percentage of the total area of the sagittal section of the vocal tract.

DATA OF MEASUREMENT

1
[a]

1	1-11 = 6	3-14 = 12	6-15 = 17
2	= 6	= 14	= 17
3	= 7	= 13	= 17
4	= 6	= 13	= 18
5	= 7	= 14	= 17



1	2-12 = 6	4-13 = 15	6-16 = 11
2	= 7	= 14	= 11
3	= 8	= 17	= 12
4	= 8	= 17	= 11
5	= 8	= 18	= 11



1	12-22 = 4	4-14 = 12	6-17 = 22
2	= 5	= 13	= 20
3	= 4	= 14	= 23
4	= 4	= 15	= 22
5	= 4	= 15	= 22



1	2-22 = 9	4-15 = 18	6-18 = 35
2	= 9	= 17	= 35
3	= 10	= 17	= 36
4	= 10	= 18	= 35
5	= 10	= 18	= 35



1	2-13 = 12	5-13 = 23	8-30 = 0
2	= 13	= 22	= 0
3	= 12	= 25	= 0
4	= 12	= 25	= 0
5	= 12	= 25	= 0



1	2-14 = 19	5-14 = 16	9-29 = 0
2	= 19	= 16	= 0
3	= 18	= 18	= 0
4	= 17	= 19	= 0
5	= 19	= 18	= 0



1	3-22 = 13	5-15 = 9	17-27 = 7
2	= 14	= 10	= 6
3	= 16	= 11	= 6
4	= 16	= 11	= 6
5	= 16	= 11	= 6

1	3-13 = 9	5-16 = 13	18-28 = 14
2	= 10	= 13	= 13
3	= 12	= 15	= 13
4	= 11	= 14	= 13
5	= 12	= 14	= 12

DATA OF MEASUREMENT

2

[ã]

1	1-11 = 7	3-14 = 12	6-15 = 18
2	= 7	= 14	= 16
3	= 7	= 14	= 16
4	= 7	= 14	= 16
5	= 6	= 14	= 16

1	2-12 = 6	4-13 = 14	6-16 = 11
2	= 6	= 15	= 9
3	= 7	= 15	= 10
4	= 7	= 15	= 10
5	= 7	= 15	= 9

1	12-22 = 7	4-14 = 11	6-17 = 19
2	= 7	= 13	= 16
3	= 8	= 13	= 18
4	= 8	= 13	= 18
5	= 7	= 13	= 17

1	2-22 = 12	4-15 = 15	6-18 = 31
2	= 12	= 16	= 28
3	= 11	= 17	= 30
4	= 11	= 16	= 30
5	= 12	= 16	= 29

1	2-13 = 14	5-13 = 22	8-30 = 0
2	= 14	= 23	= 3
3	= 13	= 23	= 3
4	= 14	= 23	= 4
5	= 14	= 23	= 4

1	2-14 = 20	5-14 = 16	9-29 = 0
2	= 21	= 16	= 2
3	= 21	= 16	= 3
4	= 21	= 16	= 5
5	= 21	= 16	= 4

1	3-22 = 15	5-15 = 9	17-27 = 6
2	= 15	= 10	= 6
3	= 14	= 11	= 7
4	= 14	= 11	= 7
5	= 16	= 11	= 7

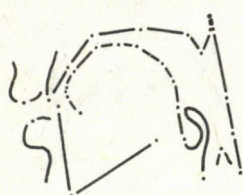
1	3-13 = 10	5-16 = 14	18-28 = 13
2	= 11	= 13	= 12
3	= 10	= 15	= 12
4	= 11	= 14	= 11
5	= 11	= 14	= 11



3
[æ]

DATA OF MEASUREMENT

1	1-11 = 6	3-14 = 11	6-15 = 16
2	= 5	= 13	= 16
3	= 8	= 13	= 17
4	= 8	= 13	= 17
5	= 7	= 13	= 17



1	2-12 = 2	4-13 = 12	6-16 = 12
2	= 4	= 13	= 11
3	= 6	= 16	= 10
4	= 6	= 16	= 10
5	= 6	= 16	= 10



1	12-22 = 4	4-14 = 4	6-17 = 22
2	= 6	= 9	= 24
3	= 5	= 13	= 25
4	= 6	= 13	= 27
5	= 6	= 13	= 24



1	2-22 = 4	4-15 = 14	6-18 = 32
2	= 3	= 14	= 36
3	= 3	= 15	= 35
4	= 10	= 16	= 36
5	= 10	= 16	= 35



1	2-13 = 10	5-13 = 24	8-30 = 0
2	= 12	= 22	= 0
3	= 13	= 23	= 0
4	= 13	= 23	= 0
5	= 12	= 23	= 0



1	2-14 = 20	5-14 = 14	9-29 = 0
2	= 21	= 13	= 0
3	= 19	= 16	= 0
4	= 20	= 15	= 0
5	= 20	= 15	= 0



1	3-22 = 9	5-15 = 5	17-27 = 15
2	= 10	= 4	= 9
3	= 14	= 9	= 4
4	= 14	= 9	= 4
5	= 13	= 9	= 5

1	3-13 = 3	5-16 = 13	18-28 = 15
2	= 8	= 12	= 13
3	= 11	= 15	= 11
4	= 11	= 13	= 13
5	= 10	= 15	= 12

DATA OF MEASUREMENT

4

[æ]

1	1-11	= 7	3-14	= 13	6-15	= 13
2		= 7		= 13		= 12
3		= 6		= 12		= 14
4		= 7		= 13		= 15
5		= 4		= 11		= 14

1	2-12	= 6	4-13	= 15	6-16	= 6
2		= 6		= 16		= 6
3		= 6		= 16		= 7
4		= 6		= 15		= 6
5		= 5		= 13		= 6

1	12-22	= 6	4-14	= 11	6-17	= 17
2		= 7		= 11		= 26
3		= 7		= 10		= 23
4		= 7		= 11		= 18
5		= 5		= 9		= 20

1	2-22	= 10	4-15	= 16	6-18	= 31
2		= 11		= 15		= 34
3		= 12		= 15		= 33
4		= 10		= 15		= 31
5		= 8		= 15		= 31

1	2-13	= 11	5-13	= 24	8-30	= 4
2		= 13		= 23		= 2
3		= 13		= 23		= 4
4		= 12		= 23		= 4
5		= 11		= 23		= 5

1	2-14	= 20	5-14	= 15	9-29	= 4
2		= 20		= 14		= 2
3		= 21		= 14		= 4
4		= 20		= 15		= 5
5		= 19		= 15		= 5

1	3-22	= 12	5-15	= 9	17-27	= 9
2		= 13		= 6		= 5
3		= 16		= 7		= 5
4		= 12		= 7		= 6
5		= 9		= 6		= 12

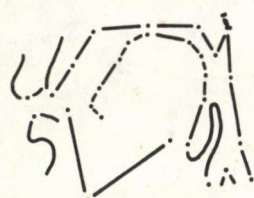
1	3-13	= 9	5-16	= 12	18-28	= 8
2		= 11		= 11		= 12
3		= 11		= 14		= 12
4		= 10		= 16		= 11
5		= 6		= 14		= 15



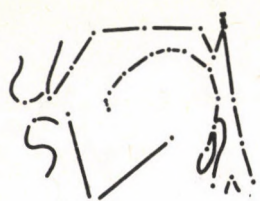
5
[0]

DATA OF MEASUREMENT

1	1-11	= 5	3-14	= 13	6-15	= 15
2		= 5		= 16		= 15
3		= 6		= 16		= 16
4		= 5		= 16		= 15
5		= 5		= 12		= 16



1	2-12	= 6	4-13	= 16	6-16	= 5
2		= 7		= 17		= 8
3		= 7		= 18		= 7
4		= 6		= 17		= 8
5		= 6		= 14		= 8



1	12-22	= 6	4-14	= 10	6-17	= 15
2		= 11		= 16		= 23
3		= 8		= 15		= 23
4		= 6		= 14		= 19
5		= 7		= 13		= 21



1	2-22	= 11	4-15	= 16	6-18	= 35
2		= 15		= 18		= 36
3		= 13		= 18		= 35
4		= 11		= 19		= 34
5		= 5		= 17		= 35



1	2-13	= 13	5-13	= 23	8-30	= 0
2		= 16		= 21		= 0
3		= 15		= 23		= 0
4		= 14		= 23		= 0
5		= 8		= 25		= 0



1	2-14	= 21	5-14	= 13	9-28	= 0
2		= 22		= 15		= 1
3		= 21		= 15		= 1
4		= 23		= 14		= 1
5		= 19		= 16		= 0



1	3-22	= 13	5-15	= 1	17-27	= 8
2		= 14		= 7		= 4
3		= 14		= 8		= 4
4		= 14		= 8		= 3
5		= 6		= 7		= 3

1	3-13	= 10	5-16	= 13	18-28	= 15
2		= 13		= 14		= 11
3		= 13		= 13		= 8
4		= 11		= 14		= 8
5		= 4		= 14		= 8

DATA OF MEASUREMENT

6 [õ]

1	1-11 = 6	3-14 = 14	6-15 = 14
2	= 6	= 15	= 15
3	= 5	= 14	= 13
4	= 2	= 12	= 13
5	= 1	= 13	= 13

1	2-12 = 6	4-13 = 17	6-16 = 5
2	= 6	= 18	= 7
3	= 5	= 17	= 4
4	= 5	= 15	= 4
5	= 3	= 13	= 7

1	12-22 = 7	4-14 = 13	6-17 = 17
2	= 8	= 14	= 17
3	= 8	= 13	= 20
4	= 7	= 12	= 15
5	= 6	= 11	= 18

1	2-22 = 12	4-15 = 17	6-18 = 31
2	= 13	= 17	= 32
3	= 13	= 17	= 29
4	= 11	= 17	= 28
5	= 8	= 17	= 31

1	2-13 = 14	5-13 = 25	8-30 = 1
2	= 15	= 25	= 1
3	= 14	= 24	= 3
4	= 13	= 23	= 4
5	= 12	= 22	= 2

1	2-14 = 21	5-14 = 17	9-29 = 1
2	= 22	= 17	= 1
3	= 21	= 16	= 3
4	= 20	= 16	= 5
5	= 21	= 13	= 2

1	3-22 = 15	5-15 = 7	17-27 = 7
2	= 15	= 9	= 4
3	= 16	= 8	= 4
4	= 12	= 8	= 5
5	= 9	= 7	= 10

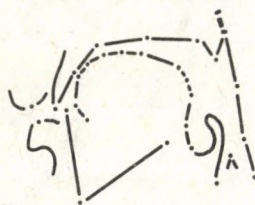
1	3-13 = 11	5-16 = 14	18-28 = 15
2	= 13	= 14	= 15
3	= 11	= 14	= 14
4	= 8	= 13	= 13
5	= 6	= 11	= 12



7
[0]
+

DATA OF MEASUREMENT

1	1-11 = 5	3-14 = 10	6-15 = 17
2	= 5	= 12	= 16
3	= 3	= 12	= 16
4	= 3	= 12	= 17
5	= 4	= 13	= 15



1	2-12 = 4	4-13 = 11	6-16 = 10
2	= 4	= 13	= 8
3	= 4	= 13	= 12
4	= 4	= 13	= 11
5	= 4	= 14	= 9



1	12-22 = 3	4-14 = 3	6-17 = 16
2	= 8	= 7	= 16
3	= 7	= 9	= 18
4	= 7	= 9	= 17
5	= 7	= 9	= 16



1	2-22 = 5	4-15 = 14	6-18 = 32
2	= 11	= 15	= 31
3	= 10	= 14	= 32
4	= 10	= 14	= 29
5	= 10	= 15	= 26



1	2-13 = 11	5-13 = 24	8-30 = 0
2	= 13	= 21	= 0
3	= 12	= 22	= 0
4	= 13	= 21	= 0
5	= 12	= 22	= 0



1	2-14 = 21	5-14 = 15	9-29 = 0
2	= 21	= 13	= 0
3	= 20	= 14	= 0
4	= 20	= 14	= 0
5	= 21	= 13	= 0

1	3-22 = 8	5-15 = 5	17-27 = 14
2	= 10	= 4	= 11
3	= 11	= 6	= 16
4	= 10	= 6	= 11
5	= 11	= 5	= 10

1	3-13 = 1	5-16 = 13	18-28 = 15
2	= 8	= 12	= 15
3	= 8	= 13	= 16
4	= 8	= 13	= 9
5	= 8	= 13	= 9

DATA OF MEASUREMENT

1	1-11 = 7	3-14 = 13	6-15 = 15
2	= 4	= 15	= 14
3	= 4	= 15	= 13
4	= 3	= 12	= 14
5	= 2	= 10	= 16

1	2-12 = 6	4-13 = 15	6-16 = 9
2	= 4	= 16	= 6
3	= 4	= 16	= 6
4	= 4	= 14	= 8
5	= 1	= 11	= 10

1	12-22 = 10	4-14 = 12	6-17 = 13
2	= 12	= 14	= 12
3	= 12	= 14	= 12
4	= 8	= 11	= 12
5	= 6	= 4	= 14

1	2-22 = 15	4-15 = 17	6-18 = 26
2	= 15	= 19	= 26
3	= 15	= 19	= 25
4	= 10	= 18	= 26
5	= 7	= 15	= 26

1	2-13 = 15	5-13 = 21	8-30 = 2
2	= 15	= 21	= 5
3	= 15	= 21	= 5
4	= 12	= 21	= 5
5	= 11	= 21	= 2

1	2-14 = 21	5-14 = 13	9-29 = 3
2	= 20	= 14	= 5
3	= 20	= 14	= 5
4	= 19	= 13	= 3
5	= 20	= 14	= 2

1	3-22 = 15	5-15 = 7	17-27 = 12
2	= 15	= 9	= 8
3	= 15	= 9	= 7
4	= 12	= 8	= 12
5	= 9	= 4	= 14

1	3-13 = 11	5-16 = 14	18-28 = 10
2	= 13	= 14	= 8
3	= 13	= 14	= 9
4	= 8	= 15	= 12
5	= 4	= 13	= 14

8
[õ]
+



9
[u]

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 11	6-15 = 14
2	= 3	= 13	= 14
3	= 2	= 15	= 14
4	= 4	= 16	= 14
5	= 3	= 14	= 15

1	2-12 = 4	4-13 = 14	6-16 = 5
2	= 4	= 14	= 5
3	= 4	= 18	= 4
4	= 4	= 17	= 4
5	= 4	= 15	= 7

1	12-22 = 10	4-14 = 9	6-17 = 13
2	= 11	= 11	= 13
3	= 15	= 14	= 11
4	= 16	= 15	= 13
5	= 11	= 13	= 16

1	2-22 = 12	4-15 = 17	6-18 = 32
2	= 14	= 17	= 32
3	= 18	= 18	= 33
4	= 19	= 17	= 33
5	= 14	= 18	= 33

1	2-13 = 13	5-13 = 23	8-30 = 0
2	= 15	= 23	= 0
3	= 18	= 22	= 0
4	= 20	= 20	= 0
5	= 15	= 23	= 0

1	2-14 = 21	5-14 = 14	9-29 = 0
2	= 23	= 14	= 0
3	= 23	= 14	= 0
4	= 24	= 14	= 0
5	= 22	= 15	= 0

1	3-22 = 11	5-15 = 2	17-27 = 8
2	= 12	= 6	= 8
3	= 16	= 6	= 6
4	= 16	= 5	= 6
5	= 13	= 6	= 6

1	3-13 = 8	5-16 = 13	18-28 = 15
2	= 10	= 13	= 14
3	= 14	= 13	= 15
4	= 15	= 13	= 12
5	= 11	= 14	= 12

DATA OF MEASUREMENT

10
[ā]

1	1-11	= 1	3-14	= 15	6-15	= 13
2		= 1		= 15		= 13
3		= 1		= 16		= 13
4		= 3		= 16		= 14
5		= 2		= 13		= 12

1	2-12	= 4	4-13	= 16	6-16	= 5
2		= 4		= 16		= 4
3		= 4		= 16		= 4
4		= 4		= 16		= 5
5		= 4		= 13		= 5

1	12-22	= 14	4-14	= 14	6-17	= 17
2		= 12		= 14		= 17
3		= 15		= 14		= 16
4		= 16		= 14		= 17
5		= 9		= 13		= 14

1	2-22	= 16	4-15	= 17	6-18	= 30
2		= 15		= 17		= 30
3		= 18		= 17		= 30
4		= 19		= 17		= 30
5		= 11		= 17		= 30

1	2-13	= 17	5-13	= 20	8-30	= 3
2		= 17		= 20		= 4
3		= 19		= 19		= 4
4		= 19		= 19		= 5
5		= 12		= 22		= 5

1	2-14	= 22	5-14	= 14	9-29	= 3
2		= 22		= 14		= 5
3		= 21		= 15		= 5
4		= 21		= 15		= 5
5		= 21		= 15		= 6

1	3-22	= 13	5-15	= 7	17-27	= 4
2		= 14		= 7		= 3
3		= 16		= 7		= 3
4		= 16		= 8		= 5
5		= 9		= 6		= 6

1	3-13	= 13	5-16	= 13	18-28	= 10
2		= 13		= 13		= 10
3		= 15		= 13		= 9
4		= 15		= 13		= 9
5		= 7		= 13		= 10



11
[4]
+

DATA OF MEASUREMENT

	1	1-11 = 3	3-14 = 9	6-15 = 17
	2	= 2	= 11	= 16
	3	= 1	= 13	= 16
	4	= 2	= 13	= 15
	5	= 1	= 11	= 15
	1	2-12 = 3	4-13 = 11	6-16 = 12
	2	= 2	= 12	= 10
	3	= 2	= 14	= 7
	4	= 2	= 13	= 6
	5	= 2	= 14	= 6
	1	12-22 = 4	4-14 = 4	6-17 = 16
	2	= 10	= 8	= 16
	3	= 14	= 10	= 15
	4	= 15	= 10	= 14
	5	= 10	= 9	= 14
	1	2-22 = 6	4-15 = 14	6-18 = 30
	2	= 12	= 16	= 30
	3	= 16	= 16	= 30
	4	= 17	= 16	= 29
	5	= 12	= 16	= 31
	1	2-13 = 11	5-13 = 24	8-30 = 0
	2	= 15	= 19	= 0
	3	= 17	= 18	= 0
	4	= 18	= 17	= 0
	5	= 13	= 21	= 0
	1	2-14 = 20	5-14 = 15	9-29 = 0
	2	= 20	= 13	= 0
	3	= 22	= 12	= 0
	4	= 21	= 13	= 0
	5	= 20	= 14	= 0
	1	3-22 = 9	5-15 = 5	17-27 = 15
	2	= 11	= 3	= 12
	3	= 15	= 3	= 9
	4	= 14	= 3	= 8
	5	= 13	= 3	= 8
	1	3-13 = 2	5-16 = 13	18-28 = 17
	2	= 9	= 13	= 14
	3	= 12	= 13	= 13
	4	= 13	= 14	= 14
	5	= 9	= 14	= 15

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 11	6-15 = 16
2	= 2	= 11	= 16
3	= 2	= 12	= 17
4	= 2	= 12	= 16
5	= 2	= 13	= 16

1	2-12 = 4	4-13 = 13	6-16 = 9
2	= 4	= 14	= 10
3	= 4	= 14	= 9
4	= 4	= 14	= 9
5	= 4	= 15	= 9

1	12-22 = 6	4-14 = 8	6-17 = 10
2	= 6	= 9	= 10
3	= 6	= 10	= 14
4	= 6	= 10	= 16
5	= 6	= 12	= 14

1	2-22 = 9	4-15 = 15	6-18 = 23
2	= 11	= 15	= 23
3	= 11	= 14	= 27
4	= 13	= 14	= 27
5	= 13	= 17	= 27

1	2-13 = 12	5-13 = 21	8-30 = 1
2	= 13	= 21	= 3
3	= 14	= 21	= 3
4	= 14	= 21	= 3
5	= 14	= 21	= 3

1	2-14 = 19	5-14 = 14	9-23 = 2
2	= 20	= 14	= 4
3	= 20	= 13	= 3
4	= 20	= 13	= 4
5	= 21	= 13	= 4

1	3-22 = 12	5-15 = 5	17-27 = 14
2	= 13	= 5	= 14
3	= 13	= 6	= 12
4	= 14	= 6	= 14
5	= 16	= 7	= 10

1	3-13 = 8	5-16 = 12	18-28 = 15
2	= 9	= 13	= 14
3	= 10	= 12	= 13
4	= 10	= 12	= 14
5	= 11	= 15	= 10

12
[ũ]
+



13
[i]

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 11	6-15 = 17
2	= 4	= 11	= 17
3	= 4	= 10	= 17
4	= 4	= 11	= 17
5	= 4	= 10	= 17

1	2-12 = 5	4-13 = 13	6-16 = 11
2	= 5	= 12	= 13
3	= 5	= 13	= 13
4	= 5	= 13	= 12
5	= 5	= 13	= 10

1	12-22 = 6	4-14 = 8	6-17 = 19
2	= 6	= 8	= 21
3	= 6	= 6	= 20
4	= 6	= 7	= 20
5	= 6	= 5	= 20

1	2-22 = 8	4-15 = 15	6-18 = 34
2	= 8	= 16	= 35
3	= 8	= 14	= 36
4	= 8	= 15	= 36
5	= 8	= 14	= 36

1	2-13 = 11	5-13 = 24	8-30 = 0
2	= 11	= 24	= 0
3	= 11	= 24	= 0
4	= 12	= 23	= 0
5	= 11	= 24	= 0

1	2-14 = 20	5-14 = 15	9-29 = 0
2	= 20	= 16	= 0
3	= 19	= 16	= 0
4	= 20	= 14	= 0
5	= 20	= 15	= 0

1	3-22 = 8	5-15 = 7	17-27 = 11
2	= 8	= 7	= 15
3	= 8	= 5	= 15
4	= 8	= 6	= 13
5	= 8	= 2	= 14

1	3-13 = 6	5-16 = 12	18-28 = 14
2	= 6	= 13	= 16
3	= 6	= 12	= 18
4	= 7	= 12	= 17
5	= 6	= 11	= 17

DATA OF MEASUREMENT

1	1-11 =	2	3-14 =	11	6-15 =	16
2	=	2	=	11	=	15
3	=	3	=	12	=	16
4	=	2	=	12	=	14
5	=	3	=	12	=	13

1	2-12 =	3	4-13 =	14	6-16 =	12
2	=	3	=	13	=	12
3	=	4	=	14	=	11
4	=	3	=	13	=	9
5	=	3	=	12	=	7

1	12-22 =	8	4-14 =	9	6-17 =	17
2	=	8	=	8	=	16
3	=	8	=	9	=	15
4	=	7	=	9	=	14
5	=	8	=	9	=	14

1	2-22 =	11	4-15 =	16	6-18 =	30
2	=	10	=	15	=	29
3	=	12	=	15	=	28
4	=	9	=	15	=	27
5	=	11	=	16	=	27

1	2-13 =	12	5-13 =	23	8-30 =	1
2	=	13	=	22	=	3
3	=	13	=	22	=	3
4	=	11	=	23	=	5
5	=	13	=	22	=	5

1	2-14 =	20	5-14 =	14	9-29 =	1
2	=	21	=	14	=	2
3	=	21	=	14	=	3
4	=	20	=	14	=	5
5	=	21	=	14	=	5

1	3-22 =	10	5-15 =	7	17-27 =	13
2	=	10	=	6	=	13
3	=	14	=	7	=	13
4	=	11	=	7	=	14
5	=	11	=	6	=	12

1	3-13 =	8	5-16 =	15	18-28 =	12
2	=	7	=	14	=	13
3	=	8	=	15	=	13
4	=	8	=	14	=	13
5	=	7	=	14	=	15

14

[i]

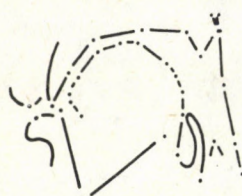


15

[i]

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 10	6-15 = 15
2	= 4	= 10	= 16
3	= 3	= 10	= 16
4	= 3	= 10	= 14
5	= 4	= 10	= 15



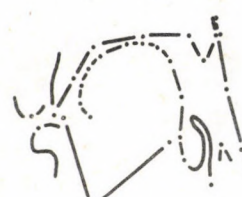
1	2-12 = 2	4-13 = 13	6-16 = 11
2	= 3	= 12	= 14
3	= 3	= 12	= 14
4	= 2	= 12	= 10
5	= 3	= 11	= 11



1	12-22 = 3	4-14 = 3	6-17 = 18
2	= 3	= 3	= 19
3	= 3	= 3	= 19
4	= 6	= 4	= 19
5	= 6	= 4	= 19



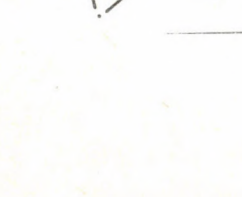
1	2-22 = 5	4-15 = 14	6-18 = 37
2	= 5	= 14	= 37
3	= 5	= 14	= 37
4	= 7	= 16	= 37
5	= 7	= 15	= 37



1	2-13 = 11	5-13 = 24	8-30 = 0
2	= 11	= 24	= 0
3	= 11	= 24	= 0
4	= 11	= 24	= 0
5	= 12	= 24	= 0



1	2-14 = 21	5-14 = 15	8-29 = 1
2	= 21	= 15	= 0
3	= 21	= 15	= 0
4	= 21	= 15	= 0
5	= 22	= 15	= 0



1	3-22 = 10	5-15 = 4	17-27 = 12
2	= 9	= 5	= 16
3	= 9	= 5	= 16
4	= 8	= 2	= 14
5	= 6	= 4	= 14

1	3-13 = 4	5-16 = 12	18-28 = 18
2	= 3	= 13	= 18
3	= 3	= 13	= 18
4	= 4	= 11	= 18
5	= 1	= 12	= 18

DATA OF MEASUREMENT

16

[i]

1	1-11 = 3	3-14 = 11	6-15 = 14
2	= 3	= 10	= 15
3	= 4	= 11	= 15
4	= 4	= 10	= 14
5	= 4	= 11	= 14

1	2-12 = 3	4-13 = 12	6-16 = 8
2	= 3	= 11	= 11
3	= 4	= 11	= 12
4	= 4	= 12	= 11
5	= 4	= 11	= 11

1	12-22 = 5	4-14 = 4	6-17 = 20
2	= 6	= 4	= 20
3	= 5	= 4	= 20
4	= 5	= 4	= 21
5	= 5	= 4	= 16

1	2-22 = 8	4-15 = 14	6-18 = 31
2	= 9	= 15	= 32
3	= 7	= 14	= 31
4	= 7	= 14	= 30
5	= 7	= 14	= 27

1	2-13 = 11	5-13 = 23	8-30 = 1
2	= 12	= 22	= 1
3	= 11	= 22	= 3
4	= 10	= 23	= 3
5	= 11	= 23	= 3

1	2-14 = 21	5-14 = 14	9-29 = 1
2	= 21	= 14	= 2
3	= 21	= 13	= 4
4	= 20	= 14	= 4
5	= 21	= 14	= 4

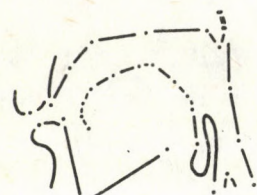




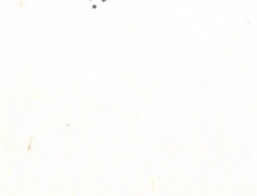

1	3-22 = 8	5-15 = 4	17-27 = 14
2	= 9	= 4	= 15
3	= 7	= 4	= 14
4	= 8	= 5	= 13
5	= 9	= 5	= 15

1	3-13 = 4	5-16 = 12	18-28 = 16
2	= 5	= 12	= 17
3	= 4	= 12	= 15
4	= 5	= 13	= 17
5	= 4	= 13	= 13



17
[e]

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 13	6-15 = 22
	2	= 4	= 12	= 22
	3	= 5	= 12	= 22
	4	= 4	= 12	= 21
	5	= 5	= 11	= 23
	1	2-12 = 6	4-13 = 14	6-16 = 18
	2	= 5	= 14	= 19
	3	= 6	= 14	= 19
	4	= 6	= 14	= 18
	5	= 6	= 14	= 18
	1	12-22 = 5	4-14 = 12	6-17 = 21
	2	= 5	= 11	= 21
	3	= 5	= 10	= 21
	4	= 6	= 9	= 21
	5	= 8	= 9	= 21
	1	2-22 = 9	4-15 = 16	6-18 = 35
	2	= 9	= 16	= 35
	3	= 10	= 16	= 35
	4	= 11	= 16	= 34
	5	= 10	= 15	= 35
	1	2-13 = 11	5-13 = 23	8-30 = 0
	2	= 12	= 23	= 0
	3	= 12	= 23	= 0
	4	= 12	= 23	= 0
	5	= 11	= 23	= 2
	1	2-14 = 20	5-14 = 15	9-29 = 0
	2	= 19	= 16	= 0
	3	= 21	= 15	= 1
	4	= 21	= 14	= 0
	5	= 19	= 15	= 0
	1	3-22 = 14	5-15 = 9	17-27 = 12
	2	= 13	= 9	= 12
	3	= 13	= 9	= 13
	4	= 13	= 7	= 12
	5	= 11	= 6	= 12
	1	3-13 = 8	5-16 = 17	18-28 = 12
	2	= 8	= 16	= 12
	3	= 8	= 17	= 13
	4	= 8	= 17	= 11
	5	= 8	= 16	= 13

DATA OF MEASUREMENT

18

[ẽ]

1	1-11 = 6	3-14 = 12	6-15 = 14
2	= 6	= 12	= 14
3	= 4	= 13	= 13
4	= 3	= 13	= 13
5	= 2	= 13	= 14

1	2-12 = 6	4-13 = 10	6-16 = 8
2	= 6	= 14	= 8
3	= 4	= 15	= 6
4	= 4	= 15	= 6
5	= 4	= 15	= 7

1	12-22 = 8	4-14 = 7	6-17 = 15
2	= 7	= 9	= 14
3	= 10	= 9	= 13
4	= 11	= 9	= 15
5	= 8	= 10	= 13

1	2-22 = 11	4-15 = 15	6-18 = 32
2	= 10	= 16	= 31
3	= 12	= 16	= 29
4	= 13	= 16	= 30
5	= 11	= 16	= 29

1	2-13 = 12	5-13 = 23	8-30 = 1
2	= 12	= 23	= 2
3	= 14	= 22	= 5
4	= 14	= 22	= 5
5	= 13	= 23	= 2

1	2-14 = 21	5-14 = 14	9-29 = 1
2	= 21	= 13	= 1
3	= 21	= 13	= 4
4	= 21	= 13	= 5
5	= 21	= 14	= 2

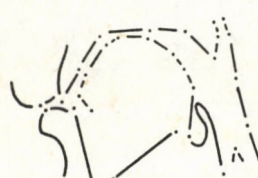




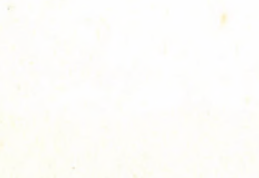

1	3-22 = 11	5-15 = 5	17-27 = 8
2	= 10	= 6	= 10
3	= 13	= 5	= 11
4	= 13	= 5	= 9
5	= 14	= 7	= 10

1	3-13 = 7	5-16 = 13	18-28 = 15
2	= 8	= 13	= 11
3	= 11	= 12	= 12
4	= 11	= 12	= 13
5	= 10	= 13	= 13



19
[e]

DATA OF MEASUREMENT

	1	1-11 = 2	3-14 = 10	6-15 = 12
	2	= 5	= 10	= 11
	3	= 5	= 11	= 13
	4	= 4	= 11	= 12
	5	= 2	= 11	= 12
	1	2-12 = 4	4-13 = 11	6-16 = 9
	2	= 5	= 11	= 8
	3	= 6	= 13	= 10
	4	= 5	= 11	= 8
	5	= 5	= 12	= 8
	1	12-22 = 4	4-14 = 4	6-17 = 18
	2	= 6	= 4	= 17
	3	= 4	= 7	= 17
	4	= 5	= 6	= 17
	5	= 3	= 7	= 17
	1	2-22 = 5	4-15 = 14	6-18 = 32
	2	= 8	= 15	= 31
	3	= 9	= 15	= 31
	4	= 9	= 14	= 31
	5	= 8	= 15	= 31
	1	2-13 = 11	5-13 = 23	8-30 = 3
	2	= 12	= 22	= 2
	3	= 11	= 23	= 0
	4	= 11	= 22	= 0
	5	= 11	= 22	= 0
	1	2-14 = 21	5-14 = 14	9-29 = 3
	2	= 21	= 14	= 2
	3	= 20	= 13	= 0
	4	= 20	= 13	= 0
	5	= 20	= 13	= 0
	1	3-22 = 8	5-15 = 4	17-27 = 13
	2	= 8	= 3	= 15
	3	= 13	= 6	= 15
	4	= 12	= 4	= 13
	5	= 12	= 4	= 13
	1	3-13 = 3	5-16 = 9	18-28 = 19
	2	= 5	= 9	= 18
	3	= 6	= 11	= 18
	4	= 6	= 9	= 18
	5	= 6	= 9	= 17

DATA OF MEASUREMENT

20
[ě]

1	1-11 = 6	3-14 = 10	6-15 = 14
2	= 6	= 11	= 14
3	= 3	= 10	= 14
4	= 3	= 10	= 14
5	= 2	= 9	= 15

1	2-12 = 6	4-13 = 11	6-16 = 12
2	= 6	= 11	= 9
3	= 5	= 12	= 9
4	= 6	= 11	= 10
5	= 6	= 10	= 11

1	12-22 = 5	4-14 = 6	6-17 = 16
2	= 5	= 7	= 14
3	= 5	= 7	= 14
4	= 5	= 7	= 15
5	= 6	= 5	= 16

1	2-22 = 9	4-15 = 15	6-18 = 27
2	= 9	= 15	= 27
3	= 9	= 15	= 27
4	= 9	= 15	= 27
5	= 8	= 15	= 28

1	2-13 = 12	5-13 = 21	8-30 = 4
2	= 12	= 21	= 4
3	= 12	= 21	= 4
4	= 12	= 21	= 4
5	= 12	= 21	= 3

1	2-14 = 20	5-14 = 13	9-29 = 4
2	= 20	= 13	= 6
3	= 19	= 14	= 6
4	= 20	= 13	= 6
5	= 20	= 14	= 2

1	3-22 = 13	5-15 = 4	17-27 = 17
2	= 13	= 5	= 14
3	= 13	= 4	= 15
4	= 12	= 4	= 15
5	= 10	= 5	= 15

1	3-13 = 6	5-16 = 11	18-28 = 14
2	= 6	= 12	= 14
3	= 7	= 11	= 14
4	= 6	= 11	= 14
5	= 4	= 12	= 15



21
[w]

DATA OF MEASUREMENT

1	1-11 = 3	3-14 = 16	6-15 = 19
2	= 3	= 16	= 18
3	= 3	= 16	= 19
4	= 3	= 16	= 19
5	= 4	= 16	= 17

1	2-12 = 8	4-13 = 18	6-16 = 7
2	= 7	= 18	= 8
3	= 8	= 18	= 7
4	= 8	= 18	= 7
5	= 7	= 18	= 7

1	12-22 = 11	4-14 = 15	6-17 = 18
2	= 12	= 15	= 17
3	= 12	= 15	= 18
4	= 12	= 15	= 18
5	= 12	= 15	= 18

1	2-22 = 14	4-15 = 17	6-18 = 28
2	= 15	= 18	= 26
3	= 15	= 18	= 26
4	= 15	= 18	= 26
5	= 16	= 19	= 26

1	2-13 = 16	5-13 = 23	8-30 = 0
2	= 16	= 23	= 0
3	= 16	= 23	= 0
4	= 16	= 23	= 0
5	= 16	= 23	= 0

1	2-14 = 20	5-14 = 17	9-29 = 0
2	= 21	= 16	= 0
3	= 21	= 15	= 0
4	= 21	= 15	= 0
5	= 21	= 15	= 0

1	3-22 = 16	5-15 = 10	17-27 = 7
2	= 16	= 9	= 7
3	= 16	= 10	= 7
4	= 16	= 10	= 7
5	= 17	= 9	= 7

1	3-13 = 15	5-16 = 17	18-28 = 8
2	= 14	= 17	= 7
3	= 14	= 17	= 7
4	= 14	= 17	= 7
5	= 15	= 17	= 7

DATA OF MEASUREMENT

1	1-11	= 2	3-14	= 11	6-15	= 17
2		= 2		= 12		= 16
3		= 1		= 11		= 16
4		= 2		= 12		= 16
5		= 3		= 12		= 16

1	2-12	= 3	4-13	= 13	6-16	= 11
2		= 3		= 13		= 9
3		= 3		= 13		= 8
4		= 4		= 13		= 7
5		= 3		= 12		= 7

1	12-22	= 7	4-14	= 9	6-17	= 19
2		= 6		= 10		= 16
3		= 7		= 9		= 14
4		= 8		= 9		= 17
5		= 8		= 9		= 15

1	2-22	= 7	4-15	= 15	6-18	= 28
2		= 6		= 16		= 28
3		= 7		= 16		= 28
4		= 10		= 15		= 28
5		= 10		= 15		= 28

1	2-13	= 9	5-13	= 23	8-30	= 0
2		= 9		= 24		= 0
3		= 9		= 23		= 0
4		= 11		= 22		= 0
5		= 13		= 20		= 0

1	2-14	= 19	5-14	= 14	9-29	= 0
2		= 19		= 14		= 0
3		= 20		= 13		= 0
4		= 19		= 13		= 0
5		= 20		= 13		= 0

1	3-22	= 4	5-15	= 6	17-27	= 11
2		= 5		= 7		= 11
3		= 4		= 6		= 10
4		= 9		= 4		= 9
5		= 9		= 4		= 9






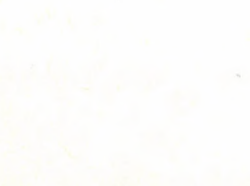
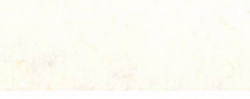
1	3-13	= 4	5-16	= 14	18-28	= 12
2		= 4		= 14		= 12
3		= 3		= 13		= 9
4		= 7		= 14		= 11
5		= 7		= 14		= 10

22
[W]
0



23
[b]

DATA OF MEASUREMENT

	1	1-11 = 0	3-14 = 15	6-15 = 15
	2	= 0	= 15	= 14
	3	= 0	= 14	= 13
	4	= 0	= 15	= 13
	5	= 4	= 16	= 15
	1	2-12 = 3	4-13 = 15	6-16 = 6
	2	= 3	= 16	= 6
	3	= 3	= 14	= 7
	4	= 4	= 15	= 6
	5	= 6	= 20	= 7
	1	12-22 = 8	4-14 = 13	6-17 = 10
	2	= 10	= 13	= 10
	3	= 10	= 13	= 10
	4	= 10	= 13	= 10
	5	= 10	= 15	= 10
	1	2-22 = 11	4-15 = 19	6-18 = 26
	2	= 13	= 19	= 25
	3	= 13	= 19	= 26
	4	= 13	= 19	= 26
	5	= 14	= 20	= 26
	1	2-13 = 13	5-13 = 23	8-30 = 0
	2	= 13	= 24	= 0
	3	= 15	= 21	= 0
	4	= 15	= 21	= 0
	5	= 14	= 26	= 0
	1	2-14 = 20	5-14 = 15	9-29 = 0
	2	= 22	= 14	= 0
	3	= 20	= 16	= 0
	4	= 20	= 15	= 0
	5	= 21	= 16	= 0
	1	3-22 = 13	5-15 = 7	17-27 = 9
	2	= 13	= 7	= 8
	3	= 13	= 7	= 9
	4	= 14	= 8	= 8
	5	= 17	= 9	= 7
	1	3-13 = 11	5-16 = 14	18-28 = 8
	2	= 11	= 13	= 8
	3	= 10	= 14	= 9
	4	= 12	= 14	= 9
	5	= 15	= 16	= 9

DATA OF MEASUREMENT

1	1-11 = 0	3-14 = 10	6-15 = 16
2	= 0	= 10	= 16
3	= 0	= 10	= 16
4	= 2	= 11	= 16
5	= 2	= 11	= 16

1	2-12 = 3	4-13 = 12	6-16 = 13
2	= 4	= 12	= 13
3	= 4	= 12	= 11
4	= 4	= 12	= 11
5	= 4	= 12	= 14

1	12-22 = 4	4-14 = 3	6-17 = 17
2	= 4	= 3	= 17
3	= 6	= 4	= 17
4	= 5	= 4	= 17
5	= 6	= 4	= 18

1	2-22 = 5	4-15 = 13	6-18 = 29
2	= 6	= 13	= 29
3	= 8	= 13	= 29
4	= 8	= 13	= 30
5	= 8	= 14	= 31

1	2-13 = 10	5-13 = 23	8-30 = 0
2	= 11	= 25	= 0
3	= 11	= 24	= 0
4	= 11	= 23	= 0
5	= 11	= 24	= 0

1	2-14 = 20	5-14 = 14	9-29 = 0
2	= 21	= 16	= 0
3	= 20	= 16	= 0
4	= 21	= 14	= 0
5	= 21	= 15	= 0

1	3-22 = 8	5-15 = 4	17-27 = 17
2	= 8	= 5	= 18
3	= 8	= 5	= 17
4	= 8	= 4	= 15
5	= 8	= 6	= 18

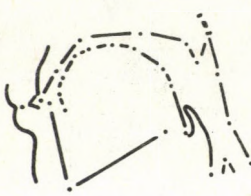





1	3-13 = 3	5-16 = 14	18-28 = 16
2	= 3	= 13	= 16
3	= 4	= 13	= 17
4	= 4	= 13	= 17
5	= 4	= 13	= 18

24
[b']



25
[b'']

DATA OF MEASUREMENT

	1	1-11 = 0	3-14 = 12	6-15 = 15
	2	= 0	= 10	= 15
	3	= 0	= 11	= 15
	4	= 0	= 11	= 14
	5	= 1	= 9	= 16
	1	2-12 = 2	4-13 = 12	6-16 = 11
	2	= 3	= 12	= 11
	3	= 3	= 12	= 11
	4	= 4	= 12	= 11
	5	= 3	= 11	= 14
	1	12-22 = 3	4-14 = 3	6-17 = 13
	2	= 3	= 4	= 13
	3	= 3	= 2	= 13
	4	= 3	= 4	= 13
	5	= 2	= 3	= 15
	1	2-22 = 5	4-15 = 16	6-18 = 28
	2	= 5	= 16	= 27
	3	= 5	= 16	= 27
	4	= 5	= 18	= 27
	5	= 5	= 15	= 28
	1	2-13 = 9	5-13 = 27	8-30 = 0
	2	= 9	= 26	= 0
	3	= 9	= 27	= 0
	4	= 9	= 27	= 0
	5	= 11	= 25	= 0
	1	2-14 = 20	5-14 = 17	9-29 = 0
	2	= 19	= 16	= 0
	3	= 21	= 17	= 0
	4	= 20	= 17	= 0
	5	= 21	= 17	= 0
	1	3-22 = 7	5-15 = 6	17-27 = 15
	2	= 8	= 5	= 15
	3	= 8	= 5	= 15
	4	= 7	= 4	= 15
	5	= 10	= 6	= 18
	1	3-13 = 2	5-16 = 13	18-28 = 14
	2	= 1	= 13	= 14
	3	= 1	= 13	= 14
	4	= 1	= 13	= 14
	5	= 2	= 14	= 17

DATA OF MEASUREMENT

26

[p]



1	1-11	= 0	3-14	= 15	6-15	= 16
2		= 0		= 15		= 16
3		= 0		= 15		= 16
4		= 1		= 15		= 16
5		= 6		= 15		= 16

1	2-12	= 3	4-13	= 16	6-16	= 8
2		= 3		= 15		= 7
3		= 3		= 15		= 8
4		= 3		= 17		= 8
5		= 4		= 17		= 8

1	12-22	= 10	4-14	= 14	6-17	= 13
2		= 13		= 14		= 12
3		= 11		= 15		= 12
4		= 9		= 15		= 11
5		= 7		= 15		= 12

1	2-22	= 12	4-15	= 19	6-18	= 30
2		= 15		= 19		= 29
3		= 13		= 19		= 30
4		= 12		= 19		= 29
5		= 11		= 19		= 28

1	2-13	= 14	5-13	= 22	8-30	= 0
2		= 16		= 20		= 0
3		= 15		= 21		= 0
4		= 14		= 23		= 0
5		= 14		= 23		= 0

1	2-14	= 20	5-14	= 15	9-29	= 0
2		= 20		= 15		= 0
3		= 20		= 16		= 0
4		= 20		= 16		= 0
5		= 20		= 16		= 0

1	3-22	= 12	5-15	= 8	17-27	= 9
2		= 13		= 8		= 9
3		= 12		= 8		= 8
4		= 14		= 9		= 9
5		= 16		= 10		= 8

1	3-13	= 11	5-16	= 13	18-28	= 11
2		= 12		= 13		= 11
3		= 11		= 13		= 11
4		= 12		= 14		= 11
5		= 12		= 14		= 10

27
[p']

DATA OF MEASUREMENT

	1	1-11 = 0	3-14 = 11	6-15 = 16
	2	= 0	= 11	= 17
	3	= 0	= 10	= 14
	4	= 0	= 11	= 15
	5	= 0	= 12	= 15
	1	2-12 = 4	4-13 = 11	6-16 = 13
	2	= 4	= 12	= 14
	3	= 3	= 13	= 11
	4	= 4	= 12	= 10
	5	= 4	= 12	= 9
	1	12-22 = 5	4-14 = 3	6-17 = 16
	2	= 4	= 2	= 17
	3	= 6	= 4	= 16
	4	= 6	= 3	= 16
	5	= 5	= 4	= 16
	1	2-22 = 5	4-15 = 15	6-18 = 29
	2	= 6	= 14	= 31
	3	= 6	= 16	= 30
	4	= 8	= 14	= 29
	5	= 7	= 14	= 29
	1	2-13 = 10	5-13 = 25	8-30 = 0
	2	= 11	= 25	= 0
	3	= 9	= 25	= 0
	4	= 11	= 24	= 0
	5	= 11	= 23	= 0
	1	2-14 = 21	5-14 = 15	9-29 = 0
	2	= 22	= 15	= 0
	3	= 20	= 16	= 0
	4	= 21	= 15	= 0
	5	= 21	= 14	= 0
	1	3-22 = 6	5-15 = 4	17-27 = 15
	2	= 7	= 6	= 16
	3	= 6	= 4	= 14
	4	= 6	= 4	= 14
	5	= 8	= 4	= 14
	1	3-13 = 1	5-16 = 13	18-28 = 16
	2	= 1	= 13	= 17
	3	= 2	= 12	= 17
	4	= 4	= 11	= 16
	5	= 4	= 12	= 17

DATA OF MEASUREMENT

28

[p']

1	1-11	= 0	3-14	= 8	6-15	= 16
2		= 0		= 9		= 17
3		= 0		= 8		= 17
4		= 0		= 8		= 17
5		= 3		= 9		= 17

1	2-12	= 3	4-13	= 8	6-16	= 13
2		= 3		= 10		= 14
3		= 3		= 9		= 16
4		= 3		= 9		= 16
5		= 4		= 9		= 17

1	12-22	= 3	4-14	= 2	6-17	= 16
2		= 3		= 2		= 16
3		= 4		= 2		= 17
4		= 3		= 2		= 17
5		= 2		= 3		= 18

1	2-22	= 5	4-15	= 16	6-18	= 28
2		= 5		= 15		= 29
3		= 6		= 15		= 30
4		= 5		= 15		= 28
5		= 5		= 15		= 30

1	2-13	= 14	5-13	= 24	8-30	= 0
2		= 12		= 25		= 0
3		= 13		= 25		= 0
4		= 13		= 25		= 0
5		= 13		= 24		= 0

1	2-14	= 21	5-14	= 18	9-28	= 0
2		= 21		= 17		= 0
3		= 21		= 18		= 0
4		= 21		= 18		= 0
5		= 21		= 17		= 0

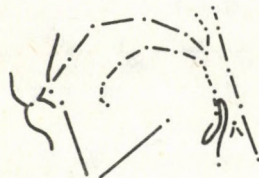






1	3-22	= 9	5-15	= 5	17-27	= 17
2		= 9		= 6		= 17
3		= 8		= 7		= 18
4		= 9		= 6		= 19
5		= 13		= 6		= 20

1	3-13	= 1	5-16	= 13	18-28	= 18
2		= 2		= 13		= 18
3		= 1		= 14		= 17
4		= 1		= 14		= 18
5		= 3		= 14		= 18



29
[m]

DATA OF MEASUREMENT

	1	1-11 = 0	3-14 = 16	6-15 = 13
	2	= 0	= 16	= 15
	3	= 0	= 16	= 14
	4	= 0	= 16	= 14
	5	= 0	= 16	= 14
	1	2-12 = 6	4-13 = 18	6-16 = 6
	2	= 5	= 18	= 7
	3	= 5	= 17	= 7
	4	= 5	= 18	= 7
	5	= 6	= 18	= 8
	1	12-22 = 11	4-14 = 14	6-17 = 14
	2	= 11	= 14	= 15
	3	= 11	= 14	= 15
	4	= 10	= 15	= 15
	5	= 10	= 15	= 15
	1	2-22 = 15	4-15 = 17	6-18 = 26
	2	= 15	= 17	= 26
	3	= 15	= 18	= 27
	4	= 14	= 18	= 27
	5	= 14	= 18	= 27
	1	2-13 = 15	5-13 = 23	8-30 = 4
	2	= 16	= 23	= 4
	3	= 16	= 22	= 3
	4	= 16	= 23	= 4
	5	= 16	= 23	= 5
	1	2-14 = 23	5-14 = 14	9-29 = 5
	2	= 23	= 14	= 3
	3	= 23	= 14	= 4
	4	= 23	= 15	= 5
	5	= 23	= 15	= 6
	1	3-22 = 15	5-15 = 9	17-27 = 7
	2	= 15	= 9	= 7
	3	= 16	= 10	= 8
	4	= 16	= 10	= 7
	5	= 16	= 10	= 7
	1	3-13 = 13	5-16 = 13	18-28 = 7
	2	= 13	= 13	= 8
	3	= 13	= 14	= 8
	4	= 13	= 14	= 8
	5	= 13	= 15	= 8

DATA OF MEASUREMENT

1	1-11	= 3	3-14	= 11	6-15	= 15
2		= 2		= 11		= 15
3		= 1		= 11		= 15
4		= 0		= 10		= 15
5		= 0		= 11		= 15

1	2-12	= 1	4-13	= 13	6-16	= 10
2		= 3		= 13		= 9
3		= 3		= 12		= 8
4		= 2		= 12		= 8
5		= 2		= 12		= 8

1	12-22	= 4	4-14	= 9	6-17	= 15
2		= 4		= 9		= 15
3		= 4		= 9		= 14
4		= 4		= 9		= 14
5		= 4		= 9		= 14

1	2-22	= 5	4-15	= 16	6-18	= 27
2		= 5		= 16		= 27
3		= 6		= 16		= 25
4		= 5		= 16		= 25
5		= 5		= 16		= 26

1	2-13	= 9	5-13	= 25	8-30	= 2
2		= 9		= 24		= 3
3		= 10		= 23		= 3
4		= 10		= 23		= 4
5		= 10		= 23		= 4

1	2-14	= 18	5-14	= 16	9-29	= 2
2		= 18		= 15		= 3
3		= 18		= 15		= 2
4		= 18		= 15		= 3
5		= 18		= 15		= 3

1	3-22	= 7	5-15	= 7	17-27	= 10
2		= 8		= 6		= 9
3		= 8		= 7		= 9
4		= 8		= 7		= 10
5		= 8		= 7		= 10

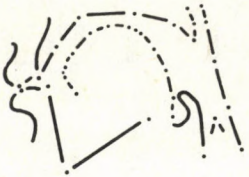

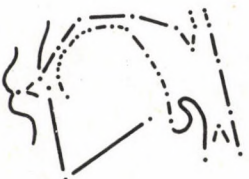




1	3-13	= 4	5-16	= 13	18-28	= 10
2		= 4		= 13		= 11
3		= 5		= 13		= 10
4		= 4		= 13		= 11
5		= 5		= 13		= 11

30
[m]



31
[m']

DATA OF MEASUREMENT

	1	1-11 = 1	3-14 = 11	6-15 = 14
	2	= 2	= 11	= 14
	3	= 0	= 11	= 15
	4	= 2	= 11	= 14
	5	= 2	= 11	= 15
	1	2-12 = 5	4-13 = 12	6-16 = 9
	2	= 4	= 12	= 9
	3	= 4	= 11	= 11
	4	= 4	= 11	= 11
	5	= 4	= 12	= 11
	1	12-22 = 6	4-14 = 6	6-17 = 15
	2	= 6	= 4	= 14
	3	= 4	= 4	= 16
	4	= 6	= 4	= 14
	5	= 6	= 4	= 15
	1	2-22 = 8	4-15 = 15	6-18 = 28
	2	= 7	= 15	= 28
	3	= 5	= 14	= 28
	4	= 6	= 15	= 27
	5	= 7	= 15	= 29
	1	2-13 = 12	5-13 = 22	8-30 = 4
	2	= 11	= 23	= 4
	3	= 11	= 23	= 4
	4	= 11	= 24	= 4
	5	= 10	= 24	= 3
	1	2-14 = 21	5-14 = 13	9-29 = 4
	2	= 21	= 14	= 4
	3	= 20	= 14	= 5
	4	= 21	= 14	= 4
	5	= 21	= 14	= 3
	1	3-22 = 9	5-15 = 4	17-27 = 14
	2	= 7	= 4	= 14
	3	= 8	= 4	= 17
	4	= 7	= 4	= 16
	5	= 8	= 4	= 14
	1	3-13 = 5	5-16 = 12	18-28 = 16
	2	= 3	= 12	= 17
	3	= 2	= 12	= 16
	4	= 2	= 13	= 16
	5	= 3	= 13	= 15

DATA OF MEASUREMENT

1	1-11	=	0	3-14	=	10	6-15	=	15
2		=	0		=	9		=	16
3		=	0		=	9		=	15
4		=	0		=	10		=	16
5		=	2		=	9		=	16

1	2-12	=	4	4-13	=	10	6-16	=	14
2		=	3		=	9		=	16
3		=	3		=	9		=	13
4		=	3		=	11		=	14
5		=	4		=	9		=	12

1	12-22	=	3	4-14	=	4	6-17	=	14
2		=	3		=	3		=	16
3		=	3		=	4		=	15
4		=	3		=	4		=	14
5		=	3		=	3		=	13

1	2-22	=	6	4-15	=	17	6-18	=	31
2		=	5		=	17		=	31
3		=	5		=	18		=	32
4		=	5		=	16		=	31
5		=	6		=	16		=	31

1	2-13	=	10	5-13	=	26	8-30	=	4
2		=	11		=	25		=	4
3		=	11		=	26		=	4
4		=	10		=	26		=	4
5		=	11		=	24		=	3

1	2-14	=	19	5-14	=	17	9-29	=	4
2		=	19		=	18		=	5
3		=	19		=	18		=	4
4		=	20		=	17		=	4
5		=	18		=	17		=	4

1	3-22	=	11	5-15	=	7	17-27	=	19
2		=	11		=	7		=	21
3		=	11		=	6		=	19
4		=	11		=	6		=	20
5		=	11		=	5		=	17








1	3-13	=	1	5-16	=	11	18-28	=	18
2		=	2		=	13		=	18
3		=	1		=	11		=	17
4		=	2		=	9		=	18
5		=	2		=	11		=	18

32
[m"]



33
[d]

DATA OF MEASUREMENT

	1	1-11 = 2	3-14 = 12	6-15 = 16
	2	= 1	= 12	= 15
	3	= 2	= 11	= 14
	4	= 2	= 13	= 15
	5	= 4	= 12	= 16
	1	2-12 = 2	4-13 = 14	6-16 = 10
	2	= 2	= 13	= 9
	3	= 2	= 13	= 8
	4	= 3	= 13	= 9
	5	= 3	= 13	= 11
	1	12-22 = 4	4-14 = 11	6-17 = 16
	2	= 4	= 10	= 15
	3	= 4	= 10	= 15
	4	= 6	= 11	= 15
	5	= 5	= 11	= 18
	1	2-22 = 5	4-15 = 16	6-18 = 27
	2	= 5	= 16	= 26
	3	= 4	= 17	= 26
	4	= 4	= 16	= 26
	5	= 5	= 17	= 30
	1	2-13 = 8	5-13 = 25	8-30 = 0
	2	= 10	= 24	= 0
	3	= 8	= 24	= 0
	4	= 8	= 24	= 0
	5	= 8	= 24	= 0
	1	2-14 = 18	5-14 = 15	8-29 = 0
	2	= 18	= 15	= 0
	3	= 18	= 15	= 0
	4	= 18	= 15	= 0
	5	= 18	= 15	= 0
	1	3-22 = 6	5-15 = 8	17-27 = 11
	2	= 5	= 7	= 11
	3	= 7	= 7	= 12
	4	= 6	= 8	= 12
	5	= 7	= 8	= 11
	1	3-13 = 5	5-16 = 14	18-28 = 13
	2	= 4	= 14	= 12
	3	= 4	= 13	= 13
	4	= 5	= 14	= 13
	5	= 4	= 16	= 12

DATA OF MEASUREMENT

34

[d]

1	1-11 = 5	3-14 = 10	6-15 = 17
2	= 5	= 10	= 17
3	= 5	= 11	= 18
4	= 5	= 10	= 18
5	= 6	= 10	= 19

1	2-12 = 2	4-13 = 12	6-16 = 13
2	= 2	= 12	= 13
3	= 1	= 12	= 14
4	= 1	= 12	= 14
5	= 2	= 12	= 15

1	12-22 = 3	4-14 = 9	6-17 = 17
2	= 4	= 8	= 18
3	= 7	= 8	= 18
4	= 6	= 9	= 18
5	= 4	= 9	= 18

1	2-22 = 4	4-15 = 17	6-18 = 27
2	= 4	= 15	= 28
3	= 7	= 17	= 28
4	= 6	= 17	= 28
5	= 4	= 17	= 28

1	2-13 = 10	5-13 = 23	8-30 = 1
2	= 11	= 22	= 0
3	= 10	= 23	= 0
4	= 10	= 24	= 0
5	= 10	= 23	= 0

1	2-14 = 19	5-14 = 15	9-29 = 0
2	= 20	= 13	= 0
3	= 20	= 13	= 0
4	= 19	= 16	= 0
5	= 19	= 15	= 0

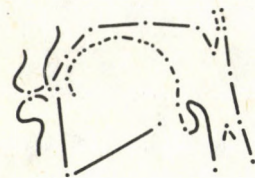




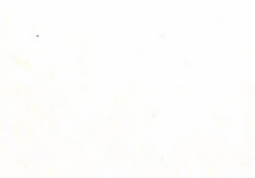

1	3-22 = 9	5-15 = 8	17-27 = 12
2	= 8	= 7	= 13
3	= 4	= 8	= 13
4	= 6	= 9	= 13
5	= 9	= 8	= 13

1	3-13 = 4	5-16 = 14	18-28 = 11
2	= 4	= 14	= 11
3	= 4	= 14	= 10
4	= 4	= 14	= 12
5	= 4	= 14	= 12



35
[d']

DATA OF MEASUREMENT

	1	1-11 = 1	3-14 = 10	6-15 = 17
	2	= 1	= 10	= 17
	3	= 2	= 11	= 18
	4	= 3	= 10	= 18
	5	= 4	= 10	= 18
	1	2-12 = 3	4-13 = 11	6-16 = 13
	2	= 3	= 11	= 12
	3	= 3	= 11	= 14
	4	= 3	= 11	= 14
	5	= 3	= 11	= 14
	1	12-22 = 4	4-14 = 5	6-17 = 17
	2	= 4	= 4	= 16
	3	= 5	= 4	= 17
	4	= 5	= 4	= 18
	5	= 3	= 4	= 18
	1	2-22 = 6	4-15 = 15	6-18 = 31
	2	= 5	= 16	= 31
	3	= 5	= 15	= 32
	4	= 7	= 15	= 33
	5	= 5	= 15	= 33
	1	2-13 = 11	5-13 = 24	8-30 = 1
	2	= 11	= 24	= 0
	3	= 11	= 24	= 0
	4	= 11	= 24	= 0
	5	= 11	= 23	= 0
	1	2-14 = 20	5-14 = 15	9-29 = 2
	2	= 21	= 15	= 0
	3	= 21	= 14	= 0
	4	= 21	= 14	= 0
	5	= 20	= 14	= 0
	1	3-22 = 7	5-15 = 5	17-27 = 15
	2	= 7	= 5	= 14
	3	= 6	= 4	= 15
	4	= 6	= 4	= 15
	5	= 10	= 4	= 15
	1	3-13 = 1	5-16 = 13	18-28 = 16
	2	= 3	= 12	= 16
	3	= 1	= 13	= 18
	4	= 2	= 12	= 17
	5	= 4	= 13	= 17

DATA OF MEASUREMENT

36

[d']

1	1-11 =	2	3-14 =	10	6-15 =	14
2	=	2	=	10	=	16
3	=	3	=	10	=	18
4	=	3	=	9	=	18
5	=	3	=	10	=	18

1	2-12 =	3	4-13 =	12	6-16 =	7
2	=	4	=	9	=	12
3	=	4	=	9	=	15
4	=	4	=	9	=	14
5	=	4	=	11	=	12

1	12-22 =	3	4-14 =	6	6-17 =	13
2	=	4	=	4	=	15
3	=	6	=	3	=	17
4	=	3	=	3	=	18
5	=	6	=	6	=	18

1	2-22 =	6	4-15 =	16	6-18 =	25
2	=	5	=	15	=	27
3	=	6	=	16	=	29
4	=	5	=	15	=	30
5	=	8	=	15	=	30

1	2-13 =	11	5-13 =	23	8-30 =	3
2	=	11	=	23	=	0
3	=	11	=	23	=	0
4	=	11	=	23	=	0
5	=	11	=	22	=	0

1	2-14 =	21	5-14 =	14	9-29 =	2
2	=	20	=	15	=	0
3	=	21	=	14	=	0
4	=	21	=	14	=	0
5	=	19	=	14	=	0

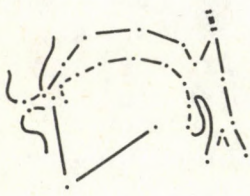






1	3-22 =	10	5-15 =	4	17-27 =	13
2	=	7	=	5	=	16
3	=	5	=	5	=	15
4	=	9	=	5	=	16
5	=	8	=	4	=	15

1	3-13 =	6	5-16 =	13	18-28 =	15
2	=	2	=	14	=	16
3	=	2	=	15	=	17
4	=	1	=	14	=	18
5	=	6	=	14	=	17



37
[t]

DATA OF MEASUREMENT

	1	1-11 = 3	3-14 = 11	6-15 = 15
	2	= 2	= 12	= 16
	3	= 2	= 11	= 14
	4	= 2	= 12	= 14
	5	= 3	= 12	= 14
	1	2-12 = 2	4-13 = 12	6-16 = 8
	2	= 2	= 12	= 10
	3	= 3	= 11	= 9
	4	= 2	= 11	= 9
	5	= 3	= 12	= 9
	1	12-22 = 4	4-14 = 9	6-17 = 13
	2	= 5	= 9	= 14
	3	= 5	= 10	= 14
	4	= 5	= 10	= 14
	5	= 5	= 10	= 13
	1	2-22 = 5	4-15 = 16	6-18 = 25
	2	= 5	= 16	= 27
	3	= 6	= 16	= 26
	4	= 5	= 16	= 27
	5	= 6	= 17	= 26
	1	2-13 = 10	5-13 = 23	8-30 = 0
	2	= 10	= 23	= 0
	3	= 12	= 24	= 0
	4	= 11	= 23	= 0
	5	= 12	= 23	= 0
	1	2-14 = 19	5-14 = 15	9-29 = 0
	2	= 20	= 14	= 0
	3	= 20	= 16	= 0
	4	= 19	= 15	= 0
	5	= 21	= 15	= 0
	1	3-22 = 6	5-15 = 8	17-27 = 11
	2	= 6	= 9	= 14
	3	= 6	= 7	= 12
	4	= 6	= 7	= 12
	5	= 6	= 8	= 10
	1	3-13 = 5	5-16 = 14	18-28 = 13
	2	= 5	= 15	= 13
	3	= 4	= 13	= 12
	4	= 4	= 14	= 11
	5	= 6	= 14	= 10

DATA OF MEASUREMENT

38

[t]

1	1-11 = 3	3-14 = 10	6-15 = 17
2	= 4	= 10	= 19
3	= 4	= 10	= 19
4	= 5	= 10	= 18
5	= 6	= 11	= 17

1	2-12 = 1	4-13 = 12	6-16 = 13
2	= 1	= 11	= 13
3	= 2	= 12	= 13
4	= 1	= 12	= 14
5	= 3	= 12	= 13

1	12-22 = 4	4-14 = 9	6-17 = 17
2	= 5	= 8	= 17
3	= 5	= 10	= 17
4	= 4	= 10	= 17
5	= 4	= 10	= 17

1	2-22 = 4	4-15 = 16	6-18 = 28
2	= 5	= 15	= 28
3	= 6	= 16	= 28
4	= 4	= 17	= 28
5	= 4	= 16	= 28

1	2-13 = 10	5-13 = 22	8-30 = 1
2	= 10	= 22	= 0
3	= 10	= 22	= 0
4	= 10	= 22	= 0
5	= 10	= 22	= 0

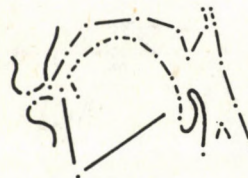
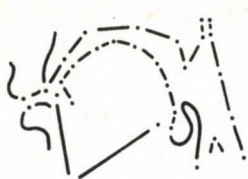





1	2-14 = 18	5-14 = 15	9-29 = 1
2	= 18	= 15	= 0
3	= 18	= 14	= 0
4	= 18	= 14	= 0
5	= 18	= 14	= 0

1	3-22 = 7	5-15 = 7	17-27 = 13
2	= 5	= 9	= 14
3	= 5	= 9	= 14
4	= 7	= 8	= 14
5	= 6	= 7	= 14

1	3-13 = 4	5-16 = 13	18-28 = 13
2	= 4	= 13	= 13
3	= 4	= 13	= 12
4	= 4	= 13	= 12
5	= 4	= 13	= 13

39
[t']

DATA OF MEASUREMENT

	1	1-11	= 3	3-14	= 10	6-15	= 13
	2		= 4		= 10		= 12
	3		= 2		= 9		= 16
	4		= 4		= 9		= 15
	5		= 2		= 9		= 15
	1	2-12	= 3	4-13	= 11	6-16	= 10
	2		= 3		= 11		= 9
	3		= 2		= 9		= 12
	4		= 2		= 10		= 10
	5		= 3		= 11		= 11
	1	12-22	= 4	4-14	= 7	6-17	= 14
	2		= 3		= 6		= 14
	3		= 4		= 4		= 16
	4		= 5		= 4		= 15
	5		= 4		= 4		= 17
	1	2-22	= 6	4-15	= 15	6-18	= 26
	2		= 4		= 16		= 26
	3		= 4		= 15		= 27
	4		= 6		= 15		= 26
	5		= 6		= 15		= 29
	1	2-13	= 11	5-13	= 22	8-30	= 2
	2		= 10		= 23		= 0
	3		= 11		= 22		= 0
	4		= 11		= 17		= 0
	5		= 11		= 21		= 0
	1	2-14	= 19	5-14	= 14	9-29	= 2
	2		= 19		= 14		= 0
	3		= 19		= 15		= 0
	4		= 19		= 9		= 0
	5		= 19		= 14		= 0
	1	3-22	= 7	5-15	= 6	17-27	= 15
	2		= 7		= 6		= 16
	3		= 7		= 5		= 16
	4		= 5		= 7		= 15
	5		= 9		= 5		= 16
	1	3-13	= 4	5-16	= 13	18-28	= 17
	2		= 4		= 12		= 18
	3		= 2		= 13		= 19
	4		= 3		= 16		= 17
	5		= 4		= 13		= 18

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 10	6-15 = 16
2	= 3	= 10	= 17
3	= 3	= 8	= 17
4	= 4	= 8	= 17
5	= 3	= 8	= 17

1	2-12 = 4	4-13 = 14	6-16 = 13
2	= 3	= 11	= 13
3	= 3	= 9	= 13
4	= 3	= 9	= 14
5	= 3	= 9	= 12

1	12-22 = 4	4-14 = 7	6-17 = 16
2	= 6	= 6	= 17
3	= 4	= 3	= 17
4	= 2	= 3	= 17
5	= 4	= 2	= 16

1	2-22 = 5	4-15 = 11	6-18 = 28
2	= 6	= 15	= 28
3	= 5	= 15	= 28
4	= 4	= 15	= 28
5	= 5	= 15	= 28

1	2-13 = 11	5-13 = 22	8-30 = 2
2	= 11	= 22	= 0
3	= 12	= 22	= 0
4	= 12	= 23	= 0
5	= 12	= 22	= 0

1	2-14 = 18	5-14 = 15	9-29 = 2
2	= 20	= 14	= 0
3	= 20	= 15	= 0
4	= 20	= 15	= 0
5	= 21	= 15	= 0

1	3-22 = 8	5-15 = 6	17-27 = 14
2	= 6	= 6	= 15
3	= 8	= 5	= 15
4	= 9	= 5	= 15
5	= 8	= 5	= 14

1	3-13 = 6	5-16 = 13	18-28 = 14
2	= 4	= 13	= 14
3	= 1	= 13	= 16
4	= 0	= 13	= 17
5	= 2	= 12	= 17

40
[t"]



41
[n]

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 11	6-15 = 13
2	= 2	= 11	= 13
3	= 3	= 12	= 13
4	= 5	= 13	= 12
5	= 5	= 13	= 13

1	2-12 = 2	4-13 = 12	6-16 = 10
2	= 3	= 12	= 10
3	= 3	= 12	= 11
4	= 4	= 14	= 9
5	= 5	= 14	= 9

1	12-22 = 6	4-14 = 10	6-17 = 16
2	= 6	= 10	= 16
3	= 6	= 10	= 16
4	= 5	= 13	= 14
5	= 8	= 12	= 15

1	2-22 = 7	4-15 = 16	6-18 = 29
2	= 6	= 16	= 29
3	= 7	= 17	= 29
4	= 6	= 17	= 28
5	= 10	= 17	= 28

1	2-13 = 10	5-13 = 23	8-30 = 5
2	= 11	= 22	= 5
3	= 11	= 22	= 5
4	= 10	= 24	= 5
5	= 11	= 23	= 5

1	2-14 = 19	5-14 = 15	9-29 = 7
2	= 19	= 15	= 7
3	= 20	= 14	= 7
4	= 19	= 16	= 9
5	= 20	= 14	= 7

1	3-22 = 4	5-15 = 9	17-27 = 13
2	= 4	= 9	= 12
3	= 4	= 10	= 13
4	= 8	= 10	= 11
5	= 10	= 10	= 8

1	3-13 = 4	5-16 = 12	18-28 = 12
2	= 4	= 12	= 10
3	= 4	= 13	= 10
4	= 6	= 13	= 9
5	= 8	= 13	= 7

DATA OF MEASUREMENT

42
[η]

1	1-11 = 2	3-14 = 12	6-15 = 10
2	= 2	= 12	= 10
3	= 2	= 12	= 10
4	= 2	= 10	= 10
5	= 2	= 10	= 10

1	2-12 = 4	4-13 = 13	6-16 = 6
2	= 4	= 14	= 6
3	= 4	= 14	= 6
4	= 4	= 12	= 6
5	= 4	= 12	= 6

1	12-22 = 6	4-14 = 10	6-17 = 15
2	= 5	= 10	= 14
3	= 5	= 10	= 14
4	= 6	= 7	= 15
5	= 6	= 7	= 15

1	2-22 = 5	4-15 = 16	6-18 = 28
2	= 3	= 16	= 27
3	= 3	= 16	= 27
4	= 6	= 16	= 28
5	= 6	= 16	= 28

1	2-13 = 9	5-13 = 25	8-30 = 8
2	= 10	= 24	= 7
3	= 10	= 24	= 7
4	= 10	= 24	= 6
5	= 10	= 24	= 6

1	2-14 = 20	5-14 = 14	9-29 = 11
2	= 20	= 14	= 11
3	= 20	= 14	= 11
4	= 20	= 15	= 10
5	= 20	= 15	= 10

1	3-22 = 7	5-15 = 6	17-27 = 12
2	= 9	= 5	= 12
3	= 9	= 5	= 12
4	= 7	= 4	= 12
5	= 7	= 4	= 12

1	3-13 = 4	5-16 = 11	18-28 = 14
2	= 7	= 11	= 14
3	= 7	= 11	= 14
4	= 4	= 10	= 14
5	= 4	= 10	= 14



43
[n']

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 9	6-15 = 9
2	= 4	= 9	= 9
3	= 4	= 9	= 9
4	= 2	= 9	= 13
5	= 4	= 9	= 14

1	2-12 = 4	4-13 = 11	6-16 = 8
2	= 4	= 9	= 8
3	= 4	= 9	= 8
4	= 3	= 9	= 11
5	= 4	= 9	= 11

1	12-22 = 3	4-14 = 5	6-17 = 18
2	= 4	= 4	= 18
3	= 4	= 4	= 18
4	= 3	= 3	= 16
5	= 4	= 2	= 16

1	2-22 = 6	4-15 = 15	6-18 = 30
2	= 5	= 15	= 31
3	= 6	= 15	= 31
4	= 5	= 15	= 28
5	= 5	= 14	= 28

1	2-13 = 11	5-13 = 22	8-30 = 9
2	= 11	= 22	= 8
3	= 12	= 22	= 9
4	= 11	= 23	= 7
5	= 12	= 22	= 6

1	2-14 = 20	5-14 = 14	9-29 = 11
2	= 20	= 14	= 11
3	= 20	= 14	= 11
4	= 21	= 14	= 7
5	= 21	= 14	= 5

1	3-22 = 11	5-15 = 4	17-27 = 17
2	= 8	= 4	= 15
3	= 9	= 5	= 15
4	= 8	= 6	= 17
5	= 7	= 5	= 16

1	3-13 = 5	5-16 = 7	18-28 = 16
2	= 1	= 7	= 17
3	= 1	= 7	= 16
4	= 0	= 12	= 16
5	= 1	= 13	= 17

DATA OF MEASUREMENT

44

[n']

1	1-11	= 4	3-14	= 10	6-15	= 14
2		= 4		= 10		= 13
3		= 3		= 9		= 14
4		= 4		= 10		= 14
5		= 3		= 10		= 15

1	2-12	= 4	4-13	= 10	6-16	= 10
2		= 4		= 10		= 10
3		= 4		= 10		= 11
4		= 4		= 9		= 11
5		= 4		= 11		= 11

1	12-22	= 5	4-14	= 4	6-17	= 14
2		= 4		= 4		= 14
3		= 2		= 4		= 15
4		= 4		= 3		= 15
5		= 6		= 7		= 15

1	2-22	= 6	4-15	= 14	6-18	= 27
2		= 5		= 15		= 25
3		= 5		= 14		= 27
4		= 5		= 14		= 27
5		= 7		= 14		= 27

1	2-13	= 11	5-13	= 23	8-30	= 5
2		= 11		= 23		= 6
3		= 11		= 22		= 5
4		= 11		= 22		= 5
5		= 11		= 22		= 4

1	2-14	= 21	5-14	= 15	9-29	= 6
2		= 21		= 14		= 7
3		= 21		= 13		= 6
4		= 21		= 13		= 5
5		= 20		= 14		= 3

1	3-22	= 7	5-15	= 6	17-27	= 15
2		= 9		= 4		= 17
3		= 10		= 5		= 18
4		= 7		= 5		= 17
5		= 7		= 8		= 17

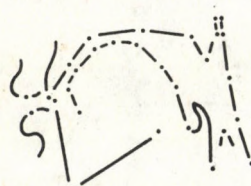
1	3-13	= 3	5-16	= 13	18-28	= 15
2		= 1		= 13		= 16
3		= 1		= 14		= 18
4		= 2		= 14		= 17
5		= 5		= 14		= 17



45
[n']

DATA OF MEASUREMENT

1	1-11 = 5	3-14 = 10	6-15 = 16
2	= 5	= 9	= 15
3	= 5	= 10	= 15
4	= 5	= 9	= 14
5	= 4	= 9	= 12

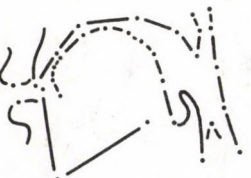


1	2-12 = 3	4-13 = 11	6-16 = 12
2	= 1	= 11	= 11
3	= 2	= 10	= 10
4	= 3	= 10	= 10
5	= 4	= 10	= 7

1	12-22 = 5	4-14 = 3	6-17 = 17
2	= 4	= 3	= 16
3	= 4	= 2	= 15
4	= 4	= 2	= 13
5	= 4	= 4	= 12



1	2-22 = 6	4-15 = 14	6-18 = 28
2	= 5	= 14	= 27
3	= 5	= 14	= 27
4	= 6	= 13	= 25
5	= 6	= 15	= 25



1	2-13 = 11	5-13 = 23	8-30 = 2
2	= 10	= 23	= 3
3	= 11	= 23	= 3
4	= 11	= 23	= 7
5	= 11	= 23	= 7



1	2-14 = 20	5-14 = 14	9-29 = 2
2	= 19	= 14	= 5
3	= 21	= 14	= 5
4	= 20	= 15	= 9
5	= 19	= 15	= 10



1	3-22 = 7	5-15 = 4	17-27 = 16
2	= 9	= 4	= 16
3	= 8	= 4	= 16
4	= 10	= 6	= 18
5	= 8	= 4	= 16

1	3-13 = 3	5-16 = 12	18-28 = 14
2	= 2	= 12	= 15
3	= 1	= 12	= 15
4	= 1	= 12	= 15
5	= 2	= 12	= 14

DATA OF MEASUREMENT

46

[7]

1	1-11 = 5	3-14 = 13	6-15 = 15
2	= 4	= 11	= 12
3	= 4	= 10	= 11
4	= 2	= 11	= 14
5	= 3	= 10	= 13

1	2-12 = 6	4-13 = 13	6-16 = 9
2	= 4	= 12	= 8
3	= 4	= 11	= 7
4	= 4	= 12	= 9
5	= 3	= 12	= 9

1	12-22 = 7	4-14 = 13	6-17 = 13
2	= 4	= 11	= 14
3	= 4	= 8	= 13
4	= 5	= 10	= 14
5	= 5	= 9	= 13

1	2-22 = 9	4-15 = 18	6-18 = 26
2	= 6	= 17	= 27
3	= 6	= 17	= 25
4	= 6	= 17	= 25
5	= 8	= 17	= 25

1	2-13 = 11	5-13 = 22	8-30 = 5
2	= 11	= 22	= 7
3	= 11	= 22	= 8
4	= 10	= 23	= 6
5	= 12	= 21	= 5

1	2-14 = 20	5-14 = 15	9-29 = 7
2	= 19	= 15	= 8
3	= 19	= 14	= 8
4	= 19	= 14	= 7
5	= 19	= 14	= 6

1	3-22 = 8	5-15 = 11	17-27 = 9
2	= 9	= 9	= 12
3	= 7	= 8	= 13
4	= 6	= 9	= 11
5	= 10	= 8	= 13

1	3-13 = 7	5-16 = 13	18-28 = 8
2	= 6	= 14	= 9
3	= 4	= 14	= 10
4	= 4	= 15	= 11
5	= 6	= 13	= 13

47
[b']

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 12	6-15 = 9
2	= 2	= 10	= 11
3	= 2	= 10	= 11
4	= 2	= 10	= 11
5	= 1	= 10	= 10

1	2-12 = 3	4-13 = 12	6-16 = 4
2	= 4	= 11	= 2
3	= 4	= 11	= 2
4	= 4	= 11	= 4
5	= 4	= 11	= 3

1	12-22 = 7	4-14 = 9	6-17 = 14
2	= 8	= 6	= 14
3	= 8	= 6	= 14
4	= 7	= 6	= 14
5	= 8	= 5	= 15

1	2-22 = 9	4-15 = 16	6-18 = 27
2	= 10	= 16	= 27
3	= 10	= 16	= 27
4	= 10	= 16	= 28
5	= 10	= 16	= 28

1	2-13 = 13	5-13 = 21	8-30 = 6
2	= 13	= 22	= 6
3	= 13	= 22	= 6
4	= 12	= 22	= 6
5	= 13	= 23	= 6

1	2-14 = 20	5-14 = 14	9-29 = 9
2	= 21	= 15	= 7
3	= 21	= 15	= 7
4	= 20	= 15	= 7
5	= 21	= 15	= 7

1	3-22 = 10	5-15 = 5	17-27 = 13
2	= 10	= 1	= 13
3	= 10	= 1	= 13
4	= 10	= 1	= 13
5	= 10	= 2	= 13

1	3-13 = 8	5-16 = 10	18-28 = 15
2	= 6	= 9	= 14
3	= 6	= 9	= 14
4	= 6	= 9	= 14
5	= 6	= 10	= 15

DATA OF MEASUREMENT

48

[g]

1	1-11 = 4	3-14 = 12	6-15 = 13
2	= 4	= 12	= 15
3	= 7	= 11	= 18
4	= 7	= 13	= 15
5	= 9	= 16	= 15

1	2-12 = 7	4-13 = 13	6-16 = 4
2	= 7	= 14	= 4
3	= 8	= 11	= 7
4	= 9	= 14	= 5
5	= 8	= 16	= 8

1	12-22 = 8	4-14 = 9	6-17 = 12
2	= 8	= 9	= 14
3	= 6	= 6	= 14
4	= 8	= 10	= 14
5	= 10	= 14	= 15

1	2-22 = 12	4-15 = 15	6-18 = 25
2	= 13	= 16	= 27
3	= 9	= 15	= 27
4	= 13	= 15	= 27
5	= 16	= 17	= 28

1	2-13 = 14	5-13 = 21	8-30 = 3
2	= 15	= 21	= 0
3	= 13	= 21	= 0
4	= 15	= 21	= 0
5	= 17	= 21	= 0

1	2-14 = 21	5-14 = 13	9-29 = 3
2	= 21	= 13	= 0
3	= 22	= 12	= 0
4	= 22	= 13	= 0
5	= 22	= 14	= 0

1	3-22 = 12	5-15 = 4	17-27 = 10
2	= 13	= 2	= 9
3	= 11	= 0	= 10
4	= 14	= 3	= 10
5	= 18	= 8	= 9

1	3-13 = 10	5-16 = 13	18-28 = 14
2	= 11	= 15	= 14
3	= 0	= 14	= 14
4	= 11	= 14	= 13
5	= 14	= 13	= 13

49
[g']

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 9	6-15 = 14
2	= 5	= 10	= 16
3	= 4	= 9	= 14
4	= 3	= 9	= 15
5	= 5	= 9	= 15

1	2-12 = 4	4-13 = 10	6-16 = 11
2	= 4	= 10	= 12
3	= 4	= 9	= 8
4	= 4	= 10	= 6
5	= 5	= 9	= 9

1	12-22 = 9	4-14 = 4	6-17 = 16
2	= 8	= 4	= 16
3	= 9	= 3	= 16
4	= 9	= 4	= 15
5	= 7	= 3	= 16

1	2-22 = 11	4-15 = 15	6-18 = 28
2	= 10	= 15	= 29
3	= 11	= 15	= 29
4	= 12	= 15	= 27
5	= 9	= 15	= 27

1	2-13 = 12	5-13 = 22	8-30 = 1
2	= 12	= 22	= 0
3	= 13	= 20	= 0
4	= 13	= 20	= 0
5	= 12	= 21	= 0

1	2-14 = 20	5-14 = 15	9-29 = 2
2	= 20	= 15	= 0
3	= 21	= 13	= 0
4	= 20	= 15	= 0
5	= 21	= 14	= 0

1	3-22 = 10	5-15 = 6	17-27 = 15
2	= 9	= 5	= 16
3	= 10	= 1	= 14
4	= 10	= 1	= 13
5	= 8	= 2	= 15

1	3-13 = 5	5-16 = 14	18-28 = 14
2	= 5	= 13	= 17
3	= 5	= 11	= 16
4	= 6	= 12	= 16
5	= 4	= 12	= 16

DATA OF MEASUREMENT

50

[g']

1	1-11	= 8	3-14	= 13	6-15	= 17
2		= 9		= 12		= 16
3		= 8		= 12		= 16
4		= 7		= 11		= 17
5		= 7		= 10		= 17

1	2-12	= 7	4-13	= 14	6-16	= 8
2		= 6		= 12		= 9
3		= 6		= 13		= 10
4		= 5		= 11		= 13
5		= 5		= 11		= 11

1	12-22	= 9	4-14	= 11	6-17	= 14
2		= 12		= 7		= 16
3		= 11		= 6		= 17
4		= 7		= 4		= 17
5		= 8		= 4		= 17

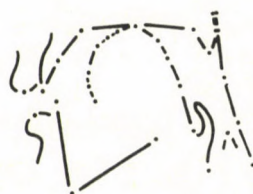
1	2-22	= 13	4-15	= 16	6-18	= 29
2		= 14		= 16		= 29
3		= 14		= 16		= 30
4		= 8		= 16		= 31
5		= 10		= 15		= 31

1	2-13	= 15	5-13	= 20	8-30	= 0
2		= 16		= 19		= 0
3		= 14		= 20		= 0
4		= 11		= 23		= 0
5		= 12		= 22		= 0

1	2-14	= 20	5-14	= 14	9-29	= 0
2		= 21		= 13		= 0
3		= 21		= 13		= 0
4		= 21		= 14		= 0
5		= 20		= 14		= 0

1	3-22	= 13	5-15	= 5	17-27	= 9
2		= 12		= 2		= 12
3		= 13		= 0		= 13
4		= 8		= 4		= 12
5		= 10		= 2		= 12

1	3-13	= 11	5-16	= 14	18-28	= 10
2		= 10		= 13		= 12
3		= 10		= 13		= 12
4		= 4		= 15		= 12
5		= 5		= 14		= 13



51
[k]

DATA OF MEASUREMENT

1	1-11 = 6	3-14 = 14	6-15 = 14
2	= 6	= 13	= 15
3	= 6	= 13	= 15
4	= 6	= 12	= 16
5	= 7	= 12	= 15

1	2-12 = 7	4-13 = 15	6-16 = 4
2	= 7	= 13	= 2
3	= 7	= 14	= 2
4	= 7	= 13	= 3
5	= 8	= 14	= 3

1	12-22 = 16	4-14 = 10	6-17 = 13
2	= 15	= 9	= 13
3	= 16	= 9	= 13
4	= 16	= 9	= 13
5	= 12	= 9	= 13

1	2-22 = 19	4-15 = 16	6-18 = 26
2	= 18	= 16	= 26
3	= 19	= 15	= 26
4	= 19	= 16	= 26
5	= 15	= 16	= 26

1	2-13 = 19	5-13 = 17	8-30 = 0
2	= 18	= 17	= 0
3	= 18	= 18	= 0
4	= 18	= 17	= 0
5	= 17	= 19	= 0

1	2-14 = 22	5-14 = 11	9-29 = 0
2	= 21	= 12	= 0
3	= 22	= 11	= 0
4	= 22	= 11	= 0
5	= 21	= 12	= 0

1	3-22 = 16	5-15 = 2	17-27 = 10
2	= 16	= 1	= 9
3	= 16	= 1	= 9
4	= 16	= 0	= 9
5	= 14	= 1	= 9

1	3-13 = 15	5-16 = 13	18-28 = 11
2	= 13	= 13	= 11
3	= 13	= 15	= 11
4	= 13	= 15	= 12
5	= 12	= 14	= 10

DATA OF MEASUREMENT

52

[k']

1	1-11 = 4	3-14 = 9	6-15 = 14
2	= 4	= 10	= 14
3	= 4	= 9	= 14
4	= 4	= 9	= 14
5	= 4	= 9	= 14

1	2-12 = 4	4-13 = 10	6-16 = 10
2	= 4	= 11	= 8
3	= 4	= 9	= 8
4	= 4	= 10	= 8
5	= 4	= 10	= 9

1	12-22 = 7	4-14 = 4	6-17 = 17
2	= 8	= 4	= 16
3	= 8	= 4	= 16
4	= 8	= 3	= 16
5	= 9	= 4	= 16

1	2-22 = 9	4-15 = 16	6-18 = 28
2	= 11	= 16	= 29
3	= 10	= 16	= 28
4	= 10	= 16	= 28
5	= 11	= 16	= 29

1	2-13 = 12	5-13 = 22	8-30 = 0
2	= 13	= 22	= 0
3	= 13	= 22	= 0
4	= 13	= 21	= 0
5	= 13	= 21	= 0

1	2-14 = 21	5-14 = 14	9-29 = 0
2	= 21	= 14	= 0
3	= 21	= 15	= 0
4	= 21	= 15	= 0
5	= 21	= 15	= 0

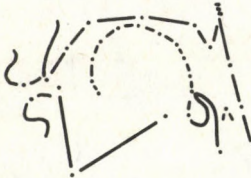






1	3-22 = 8	5-15 = 2	17-27 = 15
2	= 11	= 2	= 13
3	= 9	= 2	= 12
4	= 9	= 2	= 14
5	= 10	= 2	= 15

1	3-13 = 3	5-16 = 12	18-28 = 16
2	= 6	= 11	= 15
3	= 4	= 11	= 13
4	= 5	= 12	= 18
5	= 5	= 12	= 17



53
[k'']

DATA OF MEASUREMENT

	1	1-11 = 5	3-14 = 10	6-15 = 15
	2	= 4	= 10	= 15
	3	= 4	= 9	= 15
	4	= 5	= 9	= 15
	5	= 5	= 11	= 15
	1	2-12 = 4	4-13 = 11	6-16 = 8
	2	= 4	= 11	= 8
	3	= 4	= 11	= 8
	4	= 4	= 10	= 10
	5	= 4	= 11	= 9
	1	12-22 = 10	4-14 = 6	6-17 = 15
	2	= 9	= 5	= 15
	3	= 9	= 4	= 16
	4	= 9	= 4	= 16
	5	= 8	= 7	= 15
	1	2-22 = 13	4-15 = 15	6-18 = 28
	2	= 12	= 15	= 28
	3	= 11	= 15	= 28
	4	= 11	= 15	= 28
	5	= 11	= 15	= 28
	1	2-13 = 14	5-13 = 19	8-30 = 0
	2	= 13	= 20	= 0
	3	= 12	= 21	= 0
	4	= 13	= 20	= 0
	5	= 14	= 19	= 0
	1	2-14 = 19	5-14 = 14	9-29 = 0
	2	= 21	= 14	= 0
	3	= 19	= 15	= 0
	4	= 19	= 15	= 0
	5	= 20	= 13	= 0
	1	3-22 = 13	5-15 = 2	17-27 = 12
	2	= 13	= 2	= 12
	3	= 10	= 1	= 14
	4	= 9	= 2	= 14
	5	= 12	= 3	= 12
	1	3-13 = 8	5-16 = 11	18-28 = 15
	2	= 7	= 11	= 16
	3	= 6	= 11	= 14
	4	= 7	= 12	= 15
	5	= 8	= 13	= 16

DATA OF MEASUREMENT

54

[r]

1	1-11	= 4	3-14	= 12	6-15	= 15
2		= 4		= 13		= 16
3		= 5		= 13		= 15
4		= 5		= 13		= 15
5		= 6		= 14		= 15

1	2-12	= 5	4-13	= 14	6-16	= 11
2		= 5		= 15		= 11
3		= 5		= 13		= 10
4		= 4		= 13		= 10
5		= 6		= 13		= 6

1	12-22	= 6	4-14	= 12	6-17	= 17
2		= 6		= 13		= 17
3		= 8		= 13		= 17
4		= 7		= 13		= 16
5		= 7		= 14		= 16

1	2-22	= 9	4-15	= 17	6-18	= 30
2		= 4		= 17		= 30
3		= 5		= 18		= 30
4		= 6		= 18		= 29
5		= 8		= 18		= 29

1	2-13	= 12	5-13	= 23	8-30	= 2
2		= 6		= 28		= 0
3		= 10		= 24		= 0
4		= 10		= 24		= 0
5		= 10		= 24		= 0

1	2-14	= 20	5-14	= 15	9-29	= 1
2		= 20		= 16		= 0
3		= 20		= 16		= 0
4		= 20		= 16		= 0
5		= 20		= 16		= 0

1	3-22	= 11	5-15	= 9	17-27	= 11
2		= 8		= 9		= 11
3		= 6		= 8		= 10
4		= 6		= 8		= 11
5		= 9		= 8		= 7

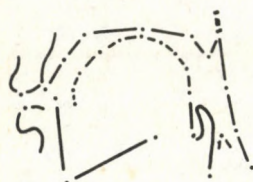
1	3-13	= 9	5-16	= 13	18-28	= 11
2		= 6		= 13		= 11
3		= 5		= 13		= 11
4		= 5		= 14		= 11
5		= 7		= 13		= 12



55
[r]

DATA OF MEASUREMENT

1	1-11 = 5	3-14 = 10	6-15 = 14
2	= 5	= 12	= 14
3	= 5	= 11	= 14
4	= 5	= 11	= 14
5	= 5	= 11	= 15



1	2-12 = 4	4-13 = 11	6-16 = 8
2	= 4	= 13	= 9
3	= 4	= 13	= 9
4	= 4	= 12	= 7
5	= 4	= 12	= 8

1	12-22 = 5	4-14 = 7	6-17 = 18
2	= 4	= 8	= 17
3	= 6	= 8	= 17
4	= 6	= 9	= 17
5	= 4	= 8	= 16



1	2-22 = 8	4-15 = 17	6-18 = 31
2	= 7	= 17	= 31
3	= 8	= 17	= 31
4	= 8	= 17	= 28
5	= 5	= 16	= 28



1	2-13 = 12	5-13 = 22	8-30 = 0
2	= 11	= 22	= 0
3	= 11	= 23	= 0
4	= 11	= 23	= 0
5	= 11	= 23	= 0



1	2-14 = 19	5-14 = 14	9-29 = 0
2	= 20	= 13	= 0
3	= 20	= 14	= 0
4	= 20	= 14	= 0
5	= 20	= 14	= 0



1	3-22 = 10	5-15 = 2	17-27 = 11
2	= 8	= 3	= 10
3	= 8	= 5	= 11
4	= 8	= 5	= 10
5	= 8	= 6	= 11

1	3-13 = 6	5-16 = 13	18-28 = 12
2	= 5	= 12	= 13
3	= 6	= 13	= 12
4	= 5	= 13	= 11
5	= 5	= 13	= 11

DATA OF MEASUREMENT

56

[r']

1	1-11 = 4	3-14 = 12	6-15 = 14
2	= 4	= 11	= 16
3	= 4	= 11	= 16
4	= 4	= 11	= 16
5	= 4	= 11	= 16

1	2-12 = 4	4-13 = 12	6-16 = 11
2	= 3	= 12	= 12
3	= 4	= 12	= 11
4	= 5	= 11	= 11
5	= 4	= 11	= 11

1	12-22 = 9	4-14 = 9	6-17 = 17
2	= 3	= 9	= 17
3	= 8	= 9	= 17
4	= 7	= 9	= 17
5	= 8	= 9	= 17

1	2-22 = 9	4-15 = 17	6-18 = 31
2	= 5	= 17	= 31
3	= 6	= 16	= 31
4	= 5	= 16	= 31
5	= 7	= 17	= 31

1	2-13 = 10	5-13 = 24	8-30 = 2
2	= 10	= 24	= 0
3	= 10	= 24	= 0
4	= 11	= 23	= 0
5	= 10	= 24	= 0

1	2-14 = 20	5-14 = 14	9-29 = 3
2	= 20	= 14	= 0
3	= 20	= 14	= 0
4	= 20	= 14	= 0
5	= 20	= 14	= 0

1	3-22 = 5	5-15 = 6	17-27 = 13
2	= 8	= 6	= 12
3	= 6	= 6	= 12
4	= 7	= 5	= 12
5	= 7	= 6	= 11

1	3-13 = 5	5-16 = 14	18-28 = 14
2	= 5	= 13	= 14
3	= 5	= 13	= 16
4	= 6	= 14	= 13
5	= 4	= 14	= 15



57
[r"]

DATA OF MEASUREMENT

1	1-11 = 6	3-14 = 13	6-15 = 19
2	= 5	= 11	= 18
3	= 4	= 10	= 17
4	= 4	= 8	= 17
5	= 5	= 9	= 17

1	2-12 = 7	4-13 = 13	6-16 = 14
2	= 6	= 12	= 13
3	= 5	= 11	= 13
4	= 6	= 10	= 14
5	= 5	= 11	= 13

1	12-22 = 9	4-14 = 13	6-17 = 17
2	= 8	= 11	= 18
3	= 12	= 7	= 17
4	= 9	= 5	= 18
5	= 8	= 7	= 18

1	2-22 = 8	4-15 = 18	6-18 = 31
2	= 6	= 17	= 32
3	= 8	= 16	= 30
4	= 6	= 16	= 30
5	= 7	= 16	= 31

1	2-13 = 10	5-13 = 24	8-30 = 0
2	= 11	= 24	= 0
3	= 11	= 24	= 0
4	= 11	= 24	= 0
5	= 11	= 23	= 0

1	2-14 = 19	5-14 = 16	9-29 = 0
2	= 19	= 16	= 0
3	= 19	= 15	= 0
4	= 19	= 16	= 0
5	= 19	= 15	= 0

1	3-22 = 7	5-15 = 11	17-27 = 10
2	= 7	= 8	= 13
3	= 4	= 6	= 12
4	= 6	= 5	= 15
5	= 7	= 6	= 13

1	3-13 = 7	5-16 = 15	18-28 = 11
2	= 4	= 14	= 13
3	= 4	= 14	= 15
4	= 2	= 15	= 15
5	= 4	= 14	= 15

DATA OF MEASUREMENT

58

[r']

1	1-11	= 4	3-14	= 10	6-15	= 16
2		= 5		= 11		= 16
3		= 5		= 10		= 16
4		= 5		= 10		= 17
5		= 5		= 10		= 16

1	2-12	= 4	4-13	= 12	6-16	= 9
2		= 4		= 12		= 9
3		= 4		= 11		= 10
4		= 4		= 11		= 11
5		= 4		= 11		= 11

1	12-22	= 7	4-14	= 7	6-17	= 19
2		= 7		= 7		= 18
3		= 6		= 6		= 18
4		= 5		= 4		= 18
5		= 4		= 7		= 19

1	2-22	= 10	4-15	= 17	6-18	= 31
2		= 10		= 16		= 30
3		= 9		= 16		= 29
4		= 6		= 15		= 31
5		= 5		= 16		= 31

1	2-13	= 13	5-13	= 22	8-30	= 0
2		= 13		= 22		= 0
3		= 12		= 23		= 0
4		= 11		= 24		= 0
5		= 11		= 24		= 0

1	2-14	= 20	5-14	= 15	9-29	= 0
2		= 21		= 14		= 0
3		= 21		= 15		= 0
4		= 21		= 15		= 0
5		= 20		= 15		= 0

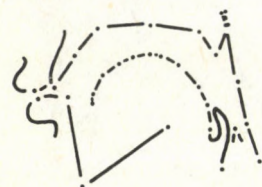






1	3-22	= 11	5-15	= 2	17-27	= 12
2		= 11		= 2		= 12
3		= 11		= 2		= 13
4		= 8		= 3		= 12
5		= 8		= 3		= 12

1	3-13	= 7	5-16	= 12	18-28	= 13
2		= 7		= 13		= 13
3		= 4		= 12		= 13
4		= 2		= 12		= 14
5		= 2		= 13		= 14



59
[v]

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 13	6-15 = 16
	2	= 2	= 12	= 16
	3	= 2	= 14	= 16
	4	= 2	= 14	= 16
	5	= 4	= 14	= 16
	1	2-12 = 5	4-13 = 14	6-16 = 11
	2	= 3	= 14	= 9
	3	= 3	= 15	= 8
	4	= 4	= 15	= 8
	5	= 4	= 16	= 10
	1	12-22 = 8	4-14 = 12	6-17 = 16
	2	= 8	= 12	= 17
	3	= 10	= 13	= 16
	4	= 11	= 13	= 16
	5	= 9	= 14	= 16
	1	2-22 = 12	4-15 = 17	6-18 = 29
	2	= 11	= 17	= 30
	3	= 13	= 17	= 30
	4	= 14	= 17	= 29
	5	= 13	= 17	= 29
	1	2-13 = 14	5-13 = 22	8-30 = 0
	2	= 15	= 22	= 0
	3	= 15	= 22	= 0
	4	= 15	= 21	= 0
	5	= 15	= 22	= 0
	1	2-14 = 21	5-14 = 15	9-29 = 0
	2	= 22	= 15	= 0
	3	= 21	= 16	= 0
	4	= 21	= 15	= 0
	5	= 21	= 16	= 0
	1	3-22 = 14	5-15 = 9	17-27 = 11
	2	= 12	= 8	= 9
	3	= 13	= 8	= 8
	4	= 12	= 8	= 7
	5	= 16	= 9	= 9
	1	3-13 = 10	5-16 = 14	18-28 = 11
	2	= 9	= 13	= 10
	3	= 11	= 13	= 10
	4	= 11	= 13	= 10
	5	= 13	= 14	= 10

DATA OF MEASUREMENT

60

[v']

1	1-11	= 2	3-14	= 9	6-15	= 16
2		= 2		= 8		= 17
3		= 1		= 8		= 17
4		= 1		= 9		= 16
5		= 2		= 8		= 17

1	2-12	= 4	4-13	= 8	6-16	= 14
2		= 4		= 9		= 14
3		= 4		= 9		= 14
4		= 4		= 9		= 14
5		= 4		= 9		= 14

1	12-22	= 6	4-14	= 4	6-17	= 18
2		= 6		= 4		= 18
3		= 5		= 3		= 17
4		= 5		= 4		= 18
5		= 8		= 3		= 18

1	2-22	= 8	4-15	= 15	6-18	= 30
2		= 6		= 14		= 30
3		= 6		= 14		= 31
4		= 6		= 15		= 31
5		= 9		= 14		= 31

1	2-13	= 13	5-13	= 22	8-30	= 0
2		= 13		= 22		= 0
3		= 13		= 22		= 0
4		= 13		= 22		= 0
5		= 13		= 22		= 0

1	2-14	= 21	5-14	= 16	9-29	= 0
2		= 20		= 16		= 0
3		= 21		= 15		= 0
4		= 21		= 14		= 0
5		= 21		= 15		= 0

1	3-22	= 9	5-15	= 7	17-27	= 16
2		= 7		= 7		= 16
3		= 8		= 7		= 17
4		= 8		= 6		= 17
5		= 6		= 7		= 17

1	3-13	= 2	5-16	= 14	18-28	= 16
2		= 1		= 15		= 16
3		= 1		= 15		= 17
4		= 1		= 15		= 17
5		= 1		= 15		= 17



61
[v']

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 9	6-15 = 16
2	= 1	= 9	= 16
3	= 2	= 7	= 16
4	= 2	= 9	= 16
5	= 2	= 9	= 15
1	2-12 = 4	4-13 = 10	6-16 = 11
2	= 4	= 10	= 11
3	= 3	= 9	= 11
4	= 4	= 9	= 11
5	= 4	= 10	= 10
1	12-22 = 5	4-14 = 7	6-17 = 16
2	= 4	= 6	= 17
3	= 6	= 4	= 17
4	= 5	= 3	= 18
5	= 6	= 4	= 17
1	2-22 = 8	4-15 = 15	6-18 = 30
2	= 7	= 15	= 30
3	= 7	= 15	= 31
4	= 6	= 14	= 31
5	= 8	= 15	= 31
1	2-13 = 14	5-13 = 22	8-30 = 0
2	= 13	= 21	= 0
3	= 13	= 23	= 0
4	= 13	= 23	= 0
5	= 12	= 23	= 0
1	2-14 = 20	5-14 = 16	9-29 = 0
2	= 21	= 14	= 0
3	= 21	= 16	= 0
4	= 21	= 15	= 0
5	= 21	= 16	= 0
1	3-22 = 11	5-15 = 6	17-27 = 12
2	= 11	= 4	= 14
3	= 8	= 5	= 15
4	= 9	= 5	= 15
5	= 9	= 4	= 14
1	3-13 = 6	5-16 = 13	18-28 = 16
2	= 5	= 13	= 16
3	= 2	= 12	= 17
4	= 3	= 13	= 18
5	= 4	= 14	= 18

DATA OF MEASUREMENT

1	1-11 = 5	3-14 = 13	6-15 = 15
2	= 4	= 14	= 16
3	= 2	= 14	= 16
4	= 4	= 14	= 16
5	= 5	= 14	= 16

1	2-12 = 6	4-13 = 13	6-16 = 9
2	= 6	= 14	= 9
3	= 5	= 14	= 9
4	= 4	= 14	= 9
5	= 5	= 14	= 9

1	12-22 = 8	4-14 = 11	6-17 = 15
2	= 10	= 13	= 16
3	= 10	= 13	= 15
4	= 11	= 13	= 15
5	= 11	= 13	= 16

1	2-22 = 12	4-15 = 17	6-18 = 29
2	= 14	= 17	= 30
3	= 14	= 17	= 30
4	= 14	= 17	= 29
5	= 14	= 17	= 30

1	2-13 = 15	5-13 = 21	8-30 = 0
2	= 17	= 19	= 0
3	= 17	= 19	= 0
4	= 17	= 19	= 0
5	= 17	= 20	= 0

1	2-14 = 21	5-14 = 14	9-29 = 0
2	= 21	= 14	= 0
3	= 21	= 14	= 0
4	= 22	= 14	= 0
5	= 21	= 15	= 0

1	3-22 = 13	5-15 = 8	17-27 = 8
2	= 14	= 7	= 8
3	= 14	= 8	= 7
4	= 14	= 8	= 5
5	= 14	= 8	= 7

1	3-13 = 11	5-16 = 14	18-28 = 9
2	= 13	= 13	= 9
3	= 13	= 13	= 9
4	= 13	= 13	= 9
5	= 13	= 14	= 10

62
[f]



63
[f']

DATA OF MEASUREMENT

1	1-11 = 3	3-14 = 10	6-15 = 14
2	= 2	= 10	= 15
3	= 2	= 10	= 14
4	= 3	= 8	= 15
5	= 3	= 8	= 15
1	2-12 = 4	4-13 = 10	6-16 = 11
2	= 4	= 9	= 11
3	= 4	= 9	= 11
4	= 4	= 9	= 13
5	= 4	= 10	= 13
1	12-22 = 4	4-14 = 6	6-17 = 17
2	= 6	= 6	= 16
3	= 6	= 4	= 15
4	= 6	= 4	= 17
5	= 6	= 5	= 17
1	2-22 = 7	4-15 = 16	6-18 = 30
2	= 8	= 15	= 30
3	= 8	= 16	= 30
4	= 8	= 15	= 31
5	= 8	= 15	= 31
1	2-13 = 13	5-13 = 20	8-30 = 0
2	= 13	= 21	= 0
3	= 14	= 22	= 0
4	= 12	= 22	= 0
5	= 12	= 22	= 0
1	2-14 = 21	5-14 = 13	9-29 = 0
2	= 21	= 13	= 0
3	= 22	= 13	= 0
4	= 20	= 14	= 0
5	= 19	= 15	= 0
1	3-22 = 11	5-15 = 5	17-27 = 15
2	= 10	= 5	= 15
3	= 9	= 5	= 16
4	= 10	= 5	= 16
5	= 10	= 5	= 16
1	3-13 = 6	5-16 = 13	18-28 = 15
2	= 5	= 14	= 15
3	= 4	= 14	= 16
4	= 4	= 15	= 16
5	= 4	= 14	= 16

DATA OF MEASUREMENT

1	1-11 = 3	3-14 = 10	6-15 = 15
2	= 2	= 9	= 15
3	= 2	= 8	= 16
4	= 2	= 9	= 15
5	= 4	= 9	= 15

1	2-12 = 4	4-13 = 10	6-16 = 11
2	= 5	= 9	= 11
3	= 4	= 9	= 11
4	= 5	= 10	= 11
5	= 4	= 9	= 11

1	12-22 = 8	4-14 = 6	6-17 = 16
2	= 5	= 5	= 17
3	= 4	= 4	= 16
4	= 6	= 4	= 17
5	= 8	= 4	= 16

1	2-22 = 9	4-15 = 16	6-18 = 30
2	= 7	= 16	= 31
3	= 8	= 15	= 31
4	= 8	= 16	= 31
5	= 10	= 16	= 31

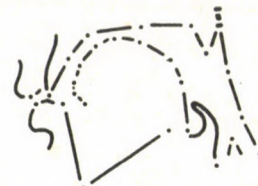
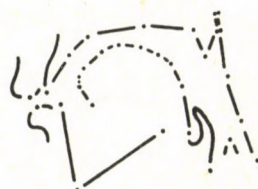
1	2-13 = 13	5-13 = 21	8-30 = 0
2	= 13	= 21	= 0
3	= 14	= 21	= 0
4	= 12	= 22	= 0
5	= 13	= 21	= 0

1	2-14 = 20	5-14 = 13	9-29 = 0
2	= 21	= 14	= 0
3	= 21	= 15	= 0
4	= 21	= 15	= 0
5	= 21	= 14	= 0

1	3-22 = 7	5-15 = 6	17-27 = 13
2	= 9	= 5	= 13
3	= 11	= 5	= 13
4	= 9	= 5	= 14
5	= 10	= 5	= 13

1	3-13 = 6	5-16 = 14	18-28 = 14
2	= 4	= 14	= 16
3	= 4	= 14	= 16
4	= 4	= 14	= 16
5	= 5	= 14	= 16

64
[f']



65
[z]

DATA OF MEASUREMENT

	1	1-11 = 2	3-14 = 12	6-15 = 17
	2	= 3	= 13	= 17
	3	= 3	= 13	= 17
	4	= 3	= 14	= 18
	5	= 3	= 13	= 18
	1	2-12 = 2	4-13 = 11	6-16 = 12
	2	= 1	= 12	= 13
	3	= 2	= 11	= 12
	4	= 2	= 12	= 13
	5	= 2	= 12	= 13
	1	12-22 = 4	4-14 = 10	6-17 = 16
	2	= 4	= 12	= 16
	3	= 5	= 12	= 16
	4	= 5	= 13	= 16
	5	= 4	= 13	= 16
	1	2-22 = 5	4-15 = 16	6-18 = 30
	2	= 4	= 17	= 30
	3	= 6	= 17	= 30
	4	= 4	= 18	= 30
	5	= 4	= 18	= 30
	1	2-13 = 13	5-13 = 20	8-30 = 0
	2	= 13	= 21	= 0
	3	= 13	= 22	= 0
	4	= 13	= 21	= 0
	5	= 13	= 21	= 0
	1	2-14 = 21	5-14 = 13	9-29 = 0
	2	= 20	= 14	= 0
	3	= 20	= 15	= 0
	4	= 21	= 14	= 0
	5	= 20	= 15	= 0
	1	3-22 = 8	5-15 = 8	17-27 = 11
	2	= 8	= 9	= 12
	3	= 8	= 11	= 11
	4	= 9	= 11	= 11
	5	= 10	= 11	= 11
	1	3-13 = 7	5-16 = 13	18-28 = 11
	2	= 8	= 14	= 11
	3	= 6	= 14	= 12
	4	= 8	= 14	= 11
	5	= 8	= 14	= 12

DATA OF MEASUREMENT

66

[z']

1	1-11 = 2	3-14 = 12	6-15 = 16
2	= 2	= 11	= 15
3	= 3	= 10	= 16
4	= 3	= 8	= 15
5	= 3	= 8	= 16

1	2-12 = 1	4-13 = 11	6-16 = 11
2	= 1	= 10	= 11
3	= 1	= 12	= 13
4	= 1	= 10	= 12
5	= 2	= 10	= 13

1	12-22 = 4	4-14 = 10	6-17 = 15
2	= 4	= 7	= 16
3	= 4	= 7	= 16
4	= 7	= 5	= 16
5	= 5	= 4	= 16

1	2-22 = 5	4-15 = 16	6-18 = 30
2	= 4	= 15	= 29
3	= 4	= 15	= 30
4	= 6	= 15	= 29
5	= 6	= 15	= 29

1	2-13 = 12	5-13 = 22	8-30 = 1
2	= 12	= 22	= 0
3	= 10	= 23	= 0
4	= 11	= 24	= 0
5	= 12	= 22	= 0

1	2-14 = 20	5-14 = 15	9-29 = 1
2	= 21	= 14	= 0
3	= 20	= 14	= 0
4	= 19	= 15	= 0
5	= 20	= 15	= 0

1	3-22 = 10	5-15 = 9	17-27 = 12
2	= 9	= 7	= 13
3	= 9	= 7	= 12
4	= 6	= 6	= 13
5	= 8	= 6	= 13

1	3-13 = 6	5-16 = 14	18-28 = 12
2	= 4	= 14	= 12
3	= 5	= 15	= 13
4	= 2	= 15	= 14
5	= 4	= 15	= 15



67

[s]

DATA OF MEASUREMENT

1	1-11 = 2	3-14 = 11	6-15 = 17
2	= 3	= 11	= 18
3	= 3	= 14	= 17
4	= 3	= 13	= 17
5	= 3	= 13	= 17

1	2-12 = 2	4-13 = 12	6-16 = 13
2	= 2	= 12	= 13
3	= 2	= 12	= 13
4	= 2	= 13	= 13
5	= 1	= 13	= 9

1	12-22 = 5	4-14 = 10	6-17 = 16
2	= 6	= 10	= 16
3	= 4	= 12	= 16
4	= 3	= 13	= 16
5	= 8	= 12	= 15

1	2-22 = 6	4-15 = 17	6-18 = 30
2	= 6	= 16	= 30
3	= 5	= 18	= 30
4	= 4	= 18	= 30
5	= 9	= 17	= 30

1	2-13 = 12	5-13 = 22	8-30 = 2
2	= 12	= 22	= 0
3	= 12	= 23	= 0
4	= 13	= 23	= 0
5	= 13	= 22	= 0

1	2-14 = 20	5-14 = 14	9-29 = 1
2	= 20	= 15	= 0
3	= 21	= 15	= 0
4	= 21	= 16	= 0
5	= 20	= 15	= 0

1	3-22 = 8	5-15 = 9	17-27 = 12
2	= 7	= 9	= 12
3	= 9	= 11	= 11
4	= 10	= 11	= 10
5	= 11	= 9	= 8

1	3-13 = 6	5-16 = 14	18-28 = 11
2	= 7	= 15	= 12
3	= 7	= 15	= 11
4	= 8	= 15	= 13
5	= 9	= 14	= 12

DATA OF MEASUREMENT

68

[s']

1	1-11 = 3	3-14 = 11	6-15 = 17
2	= 3	= 10	= 17
3	= 3	= 10	= 16
4	= 2	= 11	= 16
5	= 3	= 10	= 16

1	2-12 = 3	4-13 = 13	6-16 = 13
2	= 3	= 13	= 13
3	= 3	= 12	= 8
4	= 1	= 12	= 9
5	= 1	= 11	= 9

1	12-22 = 3	4-14 = 9	6-17 = 16
2	= 5	= 9	= 17
3	= 4	= 9	= 14
4	= 4	= 9	= 14
5	= 6	= 8	= 15

1	2-22 = 4	4-15 = 15	6-18 = 28
2	= 5	= 15	= 30
3	= 4	= 15	= 28
4	= 4	= 16	= 29
5	= 7	= 15	= 29

1	2-13 = 11	5-13 = 23	8-30 = 0
2	= 11	= 23	= 0
3	= 12	= 22	= 0
4	= 11	= 23	= 0
5	= 12	= 22	= 0

1	2-14 = 20	5-14 = 14	9-29 = 0
2	= 20	= 14	= 0
3	= 20	= 14	= 0
4	= 20	= 14	= 0
5	= 20	= 14	= 0

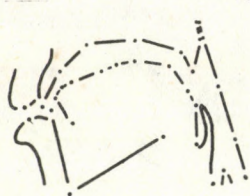





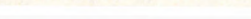
1	3-22 = 10	5-15 = 8	17-27 = 14
2	= 9	= 9	= 13
3	= 10	= 6	= 11
4	= 9	= 7	= 11
5	= 10	= 6	= 12

1	3-13 = 7	5-16 = 15	18-28 = 15
2	= 6	= 15	= 16
3	= 7	= 14	= 16
4	= 6	= 14	= 16
5	= 6	= 14	= 15



69
[3]

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 12	6-15 = 14
	2	= 5	= 12	= 16
	3	= 4	= 11	= 16
	4	= 6	= 13	= 15
	5	= 5	= 12	= 16
	1	2-12 = 2	4-13 = 11	6-16 = 6
	2	= 2	= 13	= 7
	3	= 2	= 12	= 8
	4	= 1	= 14	= 8
	5	= 2	= 13	= 6
	1	12-22 = 4	4-14 = 9	6-17 = 13
	2	= 5	= 9	= 13
	3	= 2	= 8	= 14
	4	= 4	= 9	= 14
	5	= 7	= 10	= 13
	1	2-22 = 4	4-15 = 15	6-18 = 29
	2	= 6	= 15	= 29
	3	= 3	= 15	= 30
	4	= 5	= 13	= 30
	5	= 9	= 15	= 29
	1	2-13 = 9	5-13 = 22	8-30 = 0
	2	= 9	= 24	= 0
	3	= 9	= 25	= 0
	4	= 11	= 23	= 0
	5	= 12	= 22	= 0
	1	2-14 = 18	5-14 = 14	9-29 = 0
	2	= 20	= 14	= 0
	3	= 19	= 14	= 0
	4	= 21	= 13	= 0
	5	= 20	= 14	= 0
	1	3-22 = 6	5-15 = 6	17-27 = 9
	2	= 4	= 6	= 7
	3	= 9	= 6	= 8
	4	= 8	= 5	= 8
	5	= 10	= 5	= 8
	1	3-13 = 4	5-16 = 13	18-28 = 11
	2	= 4	= 13	= 11
	3	= 4	= 13	= 11
	4	= 4	= 13	= 11
	5	= 7	= 13	= 12

DATA OF MEASUREMENT

70

[3']

1	1-11 = 5	3-14 = 12	6-15 = 13
2	= 3	= 12	= 12
3	= 3	= 12	= 13
4	= 4	= 12	= 15
5	= 4	= 11	= 16

1	2-12 = 2	4-13 = 12	6-16 = 6
2	= 2	= 12	= 6
3	= 2	= 12	= 6
4	= 2	= 12	= 8
5	= 2	= 13	= 8

1	12-22 = 7	4-14 = 7	6-17 = 12
2	= 4	= 7	= 13
3	= 2	= 7	= 12
4	= 3	= 7	= 13
5	= 4	= 5	= 13

1	2-22 = 9	4-15 = 14	6-18 = 28
2	= 4	= 14	= 29
3	= 4	= 14	= 28
4	= 5	= 14	= 29
5	= 5	= 14	= 29

1	2-13 = 12	5-13 = 22	8-30 = 0
2	= 12	= 22	= 0
3	= 12	= 22	= 0
4	= 12	= 22	= 0
5	= 11	= 23	= 0

1	2-14 = 21	5-14 = 13	9-29 = 0
2	= 21	= 13	= 0
3	= 21	= 13	= 0
4	= 21	= 13	= 0
5	= 21	= 13	= 0

1	3-22 = 8	5-15 = 6	17-27 = 11
2	= 8	= 5	= 9
3	= 9	= 5	= 12
4	= 9	= 5	= 12
5	= 8	= 4	= 11

1	3-13 = 6	5-16 = 13	18-28 = 12
2	= 6	= 13	= 14
3	= 6	= 13	= 13
4	= 6	= 13	= 13
5	= 5	= 13	= 12



71
[4]

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 9	6-15 = 14
2	= 4	= 10	= 14
3	= 3	= 10	= 15
4	= 3	= 10	= 15
5	= 6	= 9	= 15

1	2-12 = 2	4-13 = 10	6-16 = 8
2	= 2	= 11	= 7
3	= 2	= 11	= 9
4	= 2	= 11	= 11
5	= 2	= 11	= 12

1	12-22 = 3	4-14 = 2	6-17 = 11
2	= 4	= 2	= 10
3	= 3	= 4	= 12
4	= 4	= 3	= 13
5	= 4	= 3	= 13

1	2-22 = 4	4-15 = 16	6-18 = 27
2	= 5	= 16	= 26
3	= 5	= 16	= 27
4	= 4	= 16	= 28
5	= 4	= 16	= 27

1	2-13 = 10	5-13 = 26	8-30 = 2
2	= 10	= 24	= 0
3	= 11	= 25	= 0
4	= 11	= 25	= 0
5	= 10	= 25	= 0

1	2-14 = 19	5-14 = 17	8-29 = 1
2	= 20	= 16	= 0
3	= 19	= 16	= 0
4	= 20	= 17	= 0
5	= 19	= 16	= 0

1	3-22 = 8	5-15 = 5	17-27 = 12
2	= 7	= 4	= 12
3	= 10	= 5	= 15
4	= 7	= 6	= 16
5	= 8	= 6	= 16

1	3-13 = 1	5-16 = 14	18-28 = 15
2	= 1	= 13	= 16
3	= 2	= 13	= 16
4	= 2	= 14	= 15
5	= 2	= 15	= 15

DATA OF MEASUREMENT

72
[J]

1	1-11 = 4	3-14 = 11	6-15 = 17
2	= 4	= 11	= 16
3	= 4	= 11	= 17
4	= 5	= 11	= 17
5	= 6	= 11	= 17

1	2-12 = 2	4-13 = 11	6-16 = 9
2	= 2	= 11	= 8
3	= 3	= 10	= 9
4	= 3	= 11	= 8
5	= 4	= 11	= 8

1	12-22 = 8	4-14 = 9	6-17 = 14
2	= 8	= 10	= 14
3	= 8	= 9	= 14
4	= 8	= 10	= 14
5	= 9	= 10	= 14

1	2-22 = 8	4-15 = 15	6-18 = 28
2	= 9	= 16	= 28
3	= 9	= 16	= 28
4	= 9	= 16	= 28
5	= 9	= 16	= 28

1	2-13 = 11	5-13 = 22	8-30 = 0
2	= 12	= 22	= 0
3	= 15	= 19	= 0
4	= 12	= 22	= 0
5	= 13	= 21	= 0

1	2-14 = 20	5-14 = 13	9-29 = 0
2	= 20	= 14	= 0
3	= 20	= 14	= 0
4	= 20	= 14	= 0
5	= 20	= 14	= 0

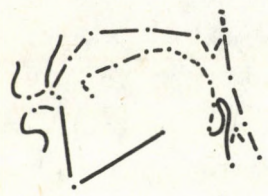
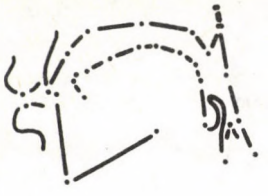





1	3-22 = 8	5-15 = 6	17-27 = 10
2	= 7	= 7	= 9
3	= 7	= 7	= 10
4	= 7	= 7	= 10
5	= 8	= 7	= 9

1	3-13 = 6	5-16 = 14	18-28 = 11
2	= 6	= 13	= 11
3	= 7	= 14	= 11
4	= 6	= 13	= 11
5	= 6	= 14	= 12



73
[J']

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 14	6-15 = 16
	2	= 4	= 11	= 17
	3	= 4	= 10	= 17
	4	= 4	= 12	= 17
	5	= 4	= 11	= 17
	1	2-12 = 4	4-13 = 12	6-16 = 7
	2	= 3	= 12	= 8
	3	= 4	= 12	= 8
	4	= 4	= 11	= 8
	5	= 4	= 12	= 9
	1	12-22 = 7	4-14 = 12	6-17 = 15
	2	= 6	= 10	= 15
	3	= 4	= 9	= 15
	4	= 6	= 12	= 15
	5	= 4	= 10	= 15
	1	2-22 = 9	4-15 = 17	6-18 = 29
	2	= 7	= 16	= 29
	3	= 6	= 15	= 29
	4	= 7	= 17	= 29
	5	= 6	= 16	= 29
	1	2-13 = 12	5-13 = 22	8-30 = 0
	2	= 11	= 22	= 0
	3	= 11	= 23	= 0
	4	= 11	= 23	= 0
	5	= 12	= 22	= 0
	1	2-14 = 21	5-14 = 14	9-29 = 0
	2	= 19	= 14	= 0
	3	= 20	= 14	= 0
	4	= 20	= 15	= 0
	5	= 20	= 14	= 0
	1	3-22 = 8	5-15 = 7	17-27 = 7
	2	= 8	= 7	= 8
	3	= 9	= 6	= 10
	4	= 7	= 7	= 9
	5	= 9	= 7	= 10
	1	3-13 = 7	5-16 = 14	18-28 = 10
	2	= 7	= 14	= 11
	3	= 5	= 14	= 12
	4	= 5	= 14	= 13
	5	= 7	= 14	= 13

DATA OF MEASUREMENT

74

[6]

1	1-11	= 4	3-14	= 9	6-15	= 15
2		= 4		= 9		= 16
3		= 4		= 10		= 16
4		= 4		= 9		= 16
5		= 4		= 10		= 16

1	2-12	= 2	4-13	= 9	6-16	= 11
2		= 2		= 11		= 13
3		= 2		= 11		= 13
4		= 2		= 10		= 15
5		= 3		= 10		= 14

1	12-22	= 4	4-14	= 3	6-17	= 15
2		= 4		= 4		= 16
3		= 4		= 3		= 16
4		= 2		= 3		= 16
5		= 2		= 4		= 16

1	2-22	= 5	4-15	= 16	6-18	= 31
2		= 5		= 15		= 31
3		= 5		= 14		= 30
4		= 4		= 15		= 31
5		= 4		= 15		= 30

1	2-13	= 11	5-13	= 23	8-30	= 0
2		= 10		= 25		= 0
3		= 11		= 24		= 0
4		= 11		= 25		= 0
5		= 11		= 24		= 0

1	2-14	= 19	5-14	= 16	9-29	= 0
2		= 20		= 15		= 0
3		= 20		= 15		= 0
4		= 19		= 16		= 0
5		= 20		= 15		= 0

1	3-22	= 7	5-15	= 4	17-27	= 14
2		= 8		= 7		= 14
3		= 6		= 6		= 16
4		= 9		= 8		= 18
5		= 8		= 6		= 17

1	3-13	= 2	5-16	= 13	18-28	= 16
2		= 3		= 14		= 15
3		= 1		= 15		= 17
4		= 1		= 15		= 18
5		= 1		= 14		= 16

75
[j]

DATA OF MEASUREMENT

1	1-11 = 3	3-14 = 8	6-15 = 16
2	= 4	= 8	= 16
3	= 5	= 7	= 15
4	= 5	= 9	= 16
5	= 5	= 9	= 16

1	2-12 = 3	4-13 = 8	6-16 = 11
2	= 4	= 8	= 11
3	= 3	= 8	= 9
4	= 4	= 12	= 10
5	= 4	= 11	= 11

1	12-22 = 7	4-14 = 3	6-17 = 15
2	= 6	= 3	= 15
3	= 6	= 3	= 15
4	= 7	= 2	= 15
5	= 7	= 4	= 15

1	2-22 = 8	4-15 = 15	6-18 = 29
2	= 8	= 14	= 30
3	= 8	= 15	= 30
4	= 8	= 14	= 30
5	= 9	= 15	= 30

1	2-13 = 13	5-13 = 21	8-30 = 1
2	= 13	= 22	= 0
3	= 13	= 21	= 0
4	= 11	= 23	= 0
5	= 12	= 21	= 0

1	2-14 = 20	5-14 = 14	9-29 = 1
2	= 21	= 14	= 0
3	= 19	= 15	= 0
4	= 21	= 14	= 0
5	= 21	= 13	= 0

1	3-22 = 8	5-15 = 4	17-27 = 14
2	= 7	= 4	= 15
3	= 7	= 3	= 15
4	= 7	= 3	= 14
5	= 9	= 3	= 14

1	3-13 = 2	5-16 = 14	18-28 = 17
2	= 1	= 13	= 17
3	= 1	= 11	= 17
4	= 3	= 14	= 17
5	= 4	= 13	= 15

DATA OF MEASUREMENT

76

[x]

1	1-11	= 4	3-14	= 11	6-15	= 15
2		= 4		= 9		= 15
3		= 4		= 9		= 15
4		= 5		= 9		= 15
5		= 5		= 9		= 15

1	2-12	= 4	4-13	= 10	6-16	= 8
2		= 4		= 10		= 7
3		= 4		= 10		= 7
4		= 4		= 10		= 7
5		= 2		= 9		= 8

1	12-22	= 7	4-14	= 7	6-17	= 15
2		= 8		= 6		= 15
3		= 4		= 4		= 15
4		= 5		= 4		= 15
5		= 3		= 4		= 15

1	2-22	= 9	4-15	= 15	6-18	= 29
2		= 9		= 15		= 29
3		= 5		= 15		= 29
4		= 6		= 15		= 29
5		= 4		= 15		= 29

1	2-13	= 13	5-13	= 20	8-30	= 0
2		= 12		= 21		= 0
3		= 11		= 22		= 0
4		= 11		= 22		= 0
5		= 12		= 22		= 0

1	2-14	= 21	5-14	= 13	9-29	= 0
2		= 20		= 13		= 0
3		= 21		= 12		= 0
4		= 21		= 13		= 0
5		= 21		= 13		= 0

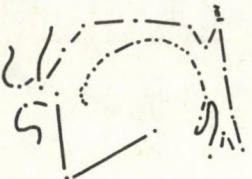





1	3-22	= 7	5-15	= 3	17-27	= 10
2		= 7		= 2		= 10
3		= 9		= 2		= 10
4		= 7		= 2		= 9
5		= 9		= 3		= 9

1	3-13	= 6	5-16	= 13	18-28	= 12
2		= 5		= 13		= 12
3		= 2		= 13		= 12
4		= 1		= 13		= 12
5		= 1		= 13		= 13



77
[x]

DATA OF MEASUREMENT

	1	1-11	= 5	3-14	= 12	6-15	= 16
	2		= 6		= 10		= 15
	3		= 6		= 9		= 16
	4		= 6		= 10		= 16
	5		= 4		= 9		= 16
	1	2-12	= 5	4-13	= 14	6-16	= 7
	2		= 5		= 11		= 7
	3		= 2		= 9		= 7
	4		= 2		= 9		= 7
	5		= 2		= 9		= 8
	1	12-22	= 7	4-14	= 11	6-17	= 15
	2		= 7		= 6		= 15
	3		= 6		= 4		= 14
	4		= 5		= 4		= 14
	5		= 5		= 4		= 14
	1	2-22	= 11	4-15	= 16	6-18	= 29
	2		= 9		= 14		= 29
	3		= 7		= 15		= 29
	4		= 6		= 15		= 29
	5		= 6		= 15		= 29
	1	2-13	= 15	5-13	= 21	8-30	= 0
	2		= 13		= 21		= 0
	3		= 13		= 22		= 0
	4		= 13		= 22		= 0
	5		= 13		= 22		= 0
	1	2-14	= 21	5-14	= 14	9-29	= 0
	2		= 22		= 13		= 0
	3		= 21		= 14		= 0
	4		= 21		= 14		= 0
	5		= 21		= 15		= 0
	1	3-22	= 13	5-15	= 7	17-27	= 7
	2		= 8		= 2		= 9
	3		= 8		= 2		= 10
	4		= 7		= 2		= 10
	5		= 8		= 3		= 11
	1	3-13	= 10	5-16	= 13	18-28	= 9
	2		= 4		= 13		= 10
	3		= 1		= 13		= 12
	4		= 3		= 13		= 12
	5		= 1		= 14		= 12

DATA OF MEASUREMENT

78

[x]

1	1-11	= 9	3-14	= 14	6-15	= 17
2		= 9		= 14		= 17
3		= 9		= 14		= 17
4		= 9		= 14		= 17
5		= 9		= 14		= 17

1	2-12	= 9	4-13	= 17	6-16	= 10
2		= 9		= 17		= 10
3		= 9		= 17		= 9
4		= 9		= 17		= 9
5		= 9		= 16		= 9

1	12-22	= 8	4-14	= 14	6-17	= 14
2		= 7		= 14		= 14
3		= 7		= 14		= 14
4		= 7		= 14		= 14
5		= 7		= 15		= 14

1	2-22	= 13	4-15	= 18	6-18	= 28
2		= 14		= 18		= 28
3		= 14		= 18		= 28
4		= 14		= 18		= 28
5		= 14		= 19		= 28

1	2-13	= 16	5-13	= 21	8-30	= 1
2		= 16		= 21		= 1
3		= 16		= 21		= 0
4		= 16		= 21		= 0
5		= 16		= 21		= 0

1	2-14	= 21	5-14	= 15	8-29	= 1
2		= 21		= 15		= 0
3		= 21		= 15		= 0
4		= 21		= 15		= 0
5		= 21		= 15		= 0




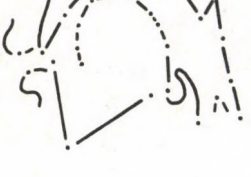



1	3-22	= 15	5-15	= 10	17-27	= 8
2		= 16		= 11		= 7
3		= 18		= 10		= 7
4		= 18		= 10		= 7
5		= 17		= 10		= 6

1	3-13	= 13	5-16	= 15	18-28	= 7
2		= 13		= 15		= 7
3		= 13		= 16		= 6
4		= 13		= 16		= 6
5		= 12		= 16		= 4



79
[ch']

DATA OF MEASUREMENT

	1	1-11 = 7	3-14 = 11	6-15 = 16
	2	= 7	= 11	= 15
	3	= 7	= 11	= 15
	4	= 7	= 11	= 16
	5	= 7	= 11	= 16
	1	2-12 = 8	4-13 = 13	6-16 = 10
	2	= 8	= 13	= 11
	3	= 8	= 13	= 12
	4	= 8	= 13	= 11
	5	= 8	= 13	= 11
	1	12-22 = 5	4-14 = 9	6-17 = 14
	2	= 5	= 9	= 15
	3	= 6	= 10	= 15
	4	= 5	= 10	= 15
	5	= 6	= 10	= 15
	1	2-22 = 11	4-15 = 15	6-18 = 27
	2	= 10	= 17	= 28
	3	= 12	= 17	= 28
	4	= 10	= 16	= 28
	5	= 11	= 17	= 28
	1	2-13 = 13	5-13 = 21	8-30 = 1
	2	= 13	= 21	= 0
	3	= 13	= 21	= 0
	4	= 13	= 21	= 0
	5	= 13	= 21	= 0
	1	2-14 = 21	5-14 = 13	9-29 = 0
	2	= 21	= 13	= 0
	3	= 20	= 14	= 0
	4	= 20	= 14	= 0
	5	= 20	= 14	= 0
	1	3-22 = 15	5-15 = 7	17-27 = 12
	2	= 14	= 7	= 12
	3	= 15	= 7	= 12
	4	= 14	= 7	= 11
	5	= 14	= 8	= 12
	1	3-13 = 8	5-16 = 15	18-28 = 11
	2	= 8	= 15	= 13
	3	= 8	= 16	= 11
	4	= 8	= 15	= 11
	5	= 8	= 15	= 13

DATA OF MEASUREMENT

80
[ch]

1	1-11	= 5	3-14	= 9	6-15	= 14
2		= 6		= 9		= 14
3		= 6		= 9		= 15
4		= 6		= 9		= 15
5		= 6		= 9		= 15

1	2-12	= 4	4-13	= 10	6-16	= 10
2		= 4		= 9		= 10
3		= 4		= 11		= 10
4		= 4		= 9		= 11
5		= 4		= 10		= 10

1	12-22	= 6	4-14	= 4	6-17	= 15
2		= 8		= 4		= 16
3		= 9		= 4		= 16
4		= 8		= 4		= 16
5		= 10		= 4		= 15

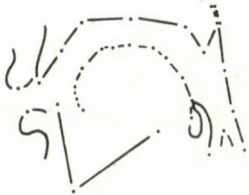
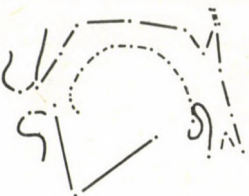
1	2-22	= 8	4-15	= 14	6-18	= 28
2		= 10		= 14		= 29
3		= 10		= 13		= 29
4		= 10		= 14		= 29
5		= 11		= 15		= 28

1	2-13	= 14	5-13	= 21	8-30	= 1
2		= 14		= 19		= 0
3		= 13		= 20		= 0
4		= 14		= 20		= 0
5		= 14		= 21		= 0

1	2-14	= 21	5-14	= 13	9-29	= 2
2		= 21		= 13		= 0
3		= 21		= 12		= 0
4		= 22		= 13		= 0
5		= 22		= 13		= 0

1	3-22	= 11	5-15	= 4	17-27	= 14
2		= 9		= 4		= 13
3		= 8		= 2		= 15
4		= 10		= 4		= 16
5		= 7		= 4		= 15

1	3-13	= 4	5-16	= 13	18-28	= 15
2		= 5		= 13		= 15
3		= 5		= 12		= 17
4		= 5		= 13		= 18
5		= 4		= 13		= 18



81

[1]

DATA OF MEASUREMENT

1	1-11 = 6	3-14 = 11	6-15 = 17
2	= 6	= 10	= 16
3	= 8	= 9	= 13
4	= 7	= 11	= 16
5	= 8	= 12	= 17

1	2-12 = 6	4-13 = 10	6-16 = 11
2	= 6	= 8	= 11
3	= 6	= 10	= 11
4	= 8	= 8	= 11
5	= 9	= 11	= 11

1	12-22 = 9	4-14 = 9	6-17 = 15
2	= 15	= 8	= 15
3	= 13	= 7	= 14
4	= 15	= 9	= 15
5	= 11	= 10	= 14

1	2-22 = 8	4-15 = 15	6-18 = 28
2	= 12	= 15	= 28
3	= 11	= 14	= 28
4	= 11	= 16	= 28
5	= 9	= 16	= 27

1	2-13 = 13	5-13 = 21	8-30 = 1
2	= 14	= 22	= 0
3	= 12	= 23	= 0
4	= 13	= 21	= 0
5	= 13	= 21	= 0

1	2-14 = 21	5-14 = 13	9-29 = 1
2	= 21	= 14	= 0
3	= 20	= 14	= 0
4	= 21	= 13	= 0
5	= 22	= 13	= 0

1	3-22 = 8	5-15 = 8	17-27 = 10
2	= 3	= 6	= 11
3	= 3	= 7	= 11
4	= 4	= 7	= 10
5	= 9	= 7	= 10

1	3-13 = 5	5-16 = 14	18-28 = 11
2	= 1	= 14	= 11
3	= 2	= 14	= 11
4	= 3	= 14	= 9
5	= 7	= 14	= 10

DATA OF MEASUREMENT

82

[!]

1	1-11 = 5	3-14 = 9	6-15 = 17
2	= 5	= 8	= 16
3	= 6	= 9	= 16
4	= 6	= 9	= 16
5	= 7	= 10	= 16

1	2-12 = 4	4-13 = 9	6-16 = 13
2	= 4	= 8	= 10
3	= 4	= 10	= 11
4	= 4	= 10	= 10
5	= 4	= 9	= 9

1	12-22 = 5	4-14 = 6	6-17 = 15
2	= 6	= 4	= 14
3	= 4	= 5	= 14
4	= 6	= 6	= 13
5	= 7	= 6	= 13

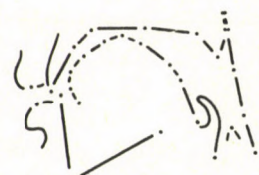
1	2-22 = 6	4-15 = 14	6-18 = 28
2	= 8	= 15	= 28
3	= 6	= 15	= 28
4	= 7	= 15	= 28
5	= 8	= 15	= 26

1	2-13 = 14	5-13 = 21	8-30 = 0
2	= 14	= 20	= 0
3	= 13	= 22	= 0
4	= 13	= 21	= 0
5	= 14	= 20	= 0

1	2-14 = 22	5-14 = 13	8-29 = 0
2	= 21	= 13	= 0
3	= 22	= 13	= 0
4	= 21	= 13	= 0
5	= 22	= 11	= 0

1	3-22 = 10	5-15 = 5	17-27 = 15
2	= 8	= 3	= 12
3	= 11	= 5	= 12
4	= 9	= 4	= 12
5	= 8	= 3	= 12

1	3-13 = 4	5-16 = 13	18-28 = 13
2	= 3	= 13	= 14
3	= 4	= 13	= 12
4	= 4	= 13	= 12
5	= 4	= 13	= 12



83
[1']

DATA OF MEASUREMENT

1	1-11 = 4	3-14 = 9	6-15 = 15
2	= 4	= 9	= 16
3	= 4	= 7	= 15
4	= 4	= 8	= 17
5	= 4	= 8	= 15

1	2-12 = 4	4-13 = 9	6-16 = 13
2	= 4	= 9	= 12
3	= 4	= 7	= 13
4	= 4	= 8	= 13
5	= 4	= 8	= 11

1	12-22 = 9	4-14 = 6	6-17 = 15
2	= 7	= 6	= 15
3	= 9	= 4	= 16
4	= 10	= 4	= 15
5	= 6	= 4	= 15

1	2-22 = 11	4-15 = 15	6-18 = 28
2	= 6	= 15	= 27
3	= 8	= 15	= 28
4	= 9	= 14	= 27
5	= 6	= 15	= 26

1	2-13 = 14	5-13 = 21	8-30 = 1
2	= 13	= 22	= 0
3	= 14	= 21	= 0
4	= 13	= 22	= 0
5	= 13	= 22	= 0

1	2-14 = 22	5-14 = 13	9-29 = 1
2	= 22	= 13	= 0
3	= 21	= 14	= 0
4	= 21	= 13	= 0
5	= 21	= 15	= 0

1	3-22 = 9	5-15 = 7	17-27 = 16
2	= 8	= 5	= 14
3	= 6	= 5	= 15
4	= 5	= 6	= 16
5	= 9	= 5	= 14

1	3-13 = 5	5-16 = 15	18-28 = 13
2	= 3	= 13	= 14
3	= 1	= 14	= 15
4	= 1	= 14	= 15
5	= 3	= 14	= 15

DATA OF MEASUREMENT

84

[dz]

1	1-11	= 3	3-14	= 10	6-15	= 15
2		= 2		= 10		= 18
3		= 2		= 11		= 18
4		= 2		= 13		= 18
5		= 1		= 13		= 20

1	2-12	= 2	4-13	= 10	6-16	= 11
2		= 2		= 10		= 14
3		= 2		= 11		= 13
4		= 3		= 11		= 12
5		= 2		= 11		= 13

1	12-22	= 5	4-14	= 9	6-17	= 14
2		= 4		= 9		= 15
3		= 5		= 10		= 15
4		= 5		= 11		= 14
5		= 6		= 11		= 15

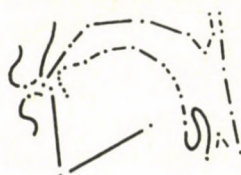
1	2-22	= 6	4-15	= 15	6-18	= 26
2		= 5		= 15		= 26
3		= 6		= 15		= 27
4		= 4		= 16		= 26
5		= 5		= 15		= 27

1	2-13	= 14	5-13	= 20	8-30	= 3
2		= 13		= 21		= 0
3		= 14		= 21		= 0
4		= 14		= 21		= 0
5		= 14		= 21		= 5

1	2-14	= 21	5-14	= 14	8-29	= 2
2		= 21		= 14		= 0
3		= 22		= 13		= 0
4		= 21		= 14		= 0
5		= 21		= 14		= 0

1	3-22	= 9	5-15	= 9	17-27	= 15
2		= 9		= 9		= 16
3		= 9		= 9		= 15
4		= 9		= 10		= 15
5		= 9		= 11		= 14

1	3-13	= 6	5-16	= 14	18-28	= 13
2		= 6		= 15		= 12
3		= 7		= 14		= 13
4		= 8		= 14		= 13
5		= 8		= 14		= 12



85
[ts]

DATA OF MEASUREMENT

	1	1-11	= 2	3-14	= 12	6-15	= 18
	2		= 3		= 12		= 18
	3		= 3		= 12		= 17
	4		= 3		= 12		= 17
	5		= 4		= 12		= 18
	1	2-12	= 2	4-13	= 12	6-16	= 13
	2		= 2		= 11		= 13
	3		= 1		= 12		= 13
	4		= 1		= 12		= 13
	5		= 3		= 12		= 13
	1	12-22	= 3	4-14	= 12	6-17	= 14
	2		= 4		= 11		= 14
	3		= 6		= 11		= 14
	4		= 6		= 11		= 14
	5		= 5		= 13		= 14
	1	2-22	= 4	4-15	= 16	6-18	= 26
	2		= 4		= 16		= 29
	3		= 6		= 16		= 27
	4		= 6		= 16		= 27
	5		= 5		= 17		= 27
	1	2-13	= 14	5-13	= 20	8-30	= 1
	2		= 14		= 20		= 0
	3		= 13		= 21		= 0
	4		= 13		= 21		= 0
	5		= 14		= 20		= 0
	1	2-14	= 21	5-14	= 13	9-29	= 0
	2		= 21		= 13		= 0
	3		= 22		= 13		= 0
	4		= 22		= 13		= 0
	5		= 21		= 14		= 0
	1	3-22	= 10	5-15	= 9	17-27	= 13
	2		= 9		= 9		= 13
	3		= 7		= 9		= 13
	4		= 7		= 9		= 13
	5		= 10		= 10		= 12
	1	3-13	= 7	5-16	= 14	18-28	= 12
	2		= 7		= 14		= 12
	3		= 6		= 14		= 11
	4		= 6		= 14		= 11
	5		= 7		= 14		= 11

DATA OF MEASUREMENT

1	1-11	= 3	3-14	= 11	6-15	= 17
2		= 3		= 10		= 16
3		= 4		= 11		= 16
4		= 4		= 11		= 16
5		= 4		= 10		= 16

1	2-12	= 2	4-13	= 10	6-16	= 12
2		= 2		= 10		= 12
3		= 2		= 10		= 12
4		= 2		= 10		= 12
5		= 3		= 10		= 13

1	12-22	= 5	4-14	= 8	6-17	= 14
2		= 3		= 7		= 15
3		= 4		= 8		= 15
4		= 4		= 8		= 15
5		= 4		= 8		= 15

1	2-22	= 6	4-15	= 14	6-18	= 27
2		= 4		= 16		= 27
3		= 4		= 15		= 27
4		= 4		= 15		= 27
5		= 4		= 16		= 27

1	2-13	= 13	5-13	= 21	8-30	= 0
2		= 13		= 21		= 0
3		= 13		= 21		= 0
4		= 13		= 21		= 0
5		= 13		= 21		= 0

1	2-14	= 21	5-14	= 13	9-29	= 0
2		= 21		= 13		= 0
3		= 21		= 13		= 0
4		= 21		= 13		= 0
5		= 20		= 14		= 0

1	3-22	= 8	5-15	= 9	17-27	= 14
2		= 9		= 7		= 14
3		= 9		= 7		= 14
4		= 9		= 7		= 14
5		= 9		= 7		= 14

1	3-13	= 6	5-16	= 13	18-28	= 13
2		= 6		= 14		= 14
3		= 6		= 13		= 14
4		= 6		= 13		= 14
5		= 6		= 14		= 15

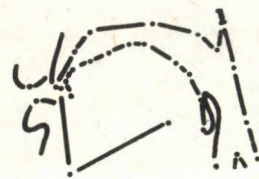




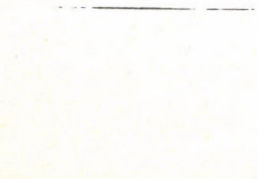

86

[ts']



87
[d3]

DATA OF MEASUREMENT

	1	1-11 = 5	3-14 = 10	6-15 = 15
	2	= 6	= 11	= 14
	3	= 5	= 11	= 15
	4	= 5	= 11	= 16
	5	= 6	= 10	= 16
	1	2-12 = 1	4-13 = 9	6-16 = 11
	2	= 2	= 9	= 10
	3	= 1	= 11	= 11
	4	= 1	= 10	= 12
	5	= 1	= 11	= 12
	1	12-22 = 4	4-14 = 8	6-17 = 13
	2	= 3	= 8	= 13
	3	= 3	= 8	= 13
	4	= 4	= 9	= 13
	5	= 4	= 9	= 14
	1	2-22 = 4	4-15 = 18	6-18 = 29
	2	= 4	= 18	= 28
	3	= 3	= 17	= 29
	4	= 4	= 17	= 28
	5	= 4	= 16	= 29
	1	2-13 = 13	5-13 = 23	8-30 = 0
	2	= 12	= 24	= 0
	3	= 10	= 25	= 0
	4	= 11	= 25	= 0
	5	= 11	= 24	= 0
	1	2-14 = 19	5-14 = 16	9-29 = 0
	2	= 19	= 17	= 0
	3	= 19	= 17	= 0
	4	= 18	= 17	= 0
	5	= 18	= 17	= 0
	1	3-22 = 8	5-15 = 7	17-27 = 14
	2	= 7	= 8	= 14
	3	= 8	= 7	= 14
	4	= 6	= 9	= 15
	5	= 8	= 9	= 15
	1	3-13 = 6	5-16 = 14	18-28 = 12
	2	= 5	= 13	= 12
	3	= 5	= 14	= 12
	4	= 4	= 15	= 12
	5	= 6	= 15	= 12

DATA OF MEASUREMENT

1	1-11	= 4	3-14	= 9	6-15	= 14
2		= 4		= 9		= 14
3		= 4		= 8		= 15
4		= 4		= 8		= 16
5		= 3		= 9		= 16

1	2-12	= 2	4-13	= 11	6-16	= 11
2		= 2		= 9		= 11
3		= 2		= 8		= 11
4		= 2		= 9		= 12
5		= 2		= 9		= 11

1	12-22	= 3	4-14	= 7	6-17	= 15
2		= 3		= 7		= 14
3		= 1		= 7		= 15
4		= 3		= 7		= 16
5		= 3		= 7		= 16

1	2-22	= 4	4-15	= 17	6-18	= 30
2		= 4		= 17		= 29
3		= 3		= 17		= 28
4		= 4		= 16		= 29
5		= 4		= 17		= 29

1	2-13	= 10	5-13	= 25	8-30	= 1
2		= 11		= 24		= 2
3		= 12		= 21		= 1
4		= 12		= 23		= 0
5		= 11		= 24		= 0

1	2-14	= 17	5-14	= 17	9-29	= 0
2		= 17		= 17		= 0
3		= 17		= 16		= 0
4		= 17		= 17		= 0
5		= 17		= 17		= 0

1	3-22	= 8	5-15	= 7	17-27	= 14
2		= 8		= 7		= 14
3		= 10		= 7		= 14
4		= 8		= 8		= 14
5		= 8		= 8		= 13

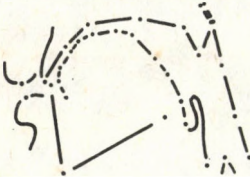






1	3-13	= 6	5-16	= 13	18-28	= 15
2		= 4		= 13		= 16
3		= 4		= 15		= 14
4		= 4		= 13		= 14
5		= 4		= 13		= 14

88
[d3]



89
[dž]

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 9	6-15 = 15
	2	= 4	= 7	= 15
	3	= 4	= 8	= 15
	4	= 5	= 8	= 15
	5	= 5	= 9	= 15
	1	2-12 = 1	4-13 = 9	6-16 = 12
	2	= 1	= 9	= 13
	3	= 1	= 9	= 13
	4	= 1	= 9	= 13
	5	= 1	= 9	= 11
	1	12-22 = 4	4-14 = 3	6-17 = 14
	2	= 4	= 4	= 15
	3	= 4	= 4	= 15
	4	= 3	= 3	= 15
	5	= 3	= 3	= 14
	1	2-22 = 4	4-15 = 15	6-18 = 29
	2	= 4	= 15	= 29
	3	= 4	= 15	= 29
	4	= 3	= 15	= 30
	5	= 3	= 15	= 29
	1	2-13 = 11	5-13 = 23	8-30 = 0
	2	= 12	= 22	= 0
	3	= 11	= 23	= 0
	4	= 12	= 22	= 0
	5	= 11	= 23	= 0
	1	2-14 = 18	5-14 = 16	9-29 = 0
	2	= 18	= 16	= 0
	3	= 18	= 16	= 0
	4	= 19	= 16	= 0
	5	= 19	= 16	= 0
	1	3-22 = 9	5-15 = 6	17-27 = 15
	2	= 9	= 6	= 15
	3	= 9	= 6	= 18
	4	= 10	= 6	= 17
	5	= 9	= 6	= 15
	1	3-13 = 1	5-16 = 14	18-28 = 14
	2	= 1	= 14	= 14
	3	= 3	= 13	= 17
	4	= 1	= 13	= 17
	5	= 3	= 14	= 15

DATA OF MEASUREMENT

90
[tj]

1	1-11 = 3	3-14 = 9	6-15 = 14
2	= 4	= 10	= 14
3	= 4	= 9	= 14
4	= 3	= 9	= 15
5	= 3	= 10	= 13

1	2-12 = 2	4-13 = 12	6-16 = 11
2	= 3	= 12	= 11
3	= 4	= 10	= 11
4	= 3	= 11	= 11
5	= 3	= 11	= 11

1	12-22 = 5	4-14 = 8	6-17 = 14
2	= 5	= 8	= 14
3	= 5	= 8	= 14
4	= 4	= 9	= 14
5	= 5	= 9	= 14

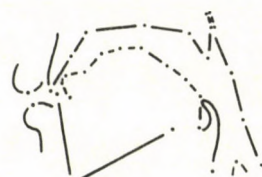
1	2-22 = 5	4-15 = 17	6-18 = 29
2	= 4	= 17	= 29
3	= 6	= 17	= 29
4	= 3	= 17	= 29
5	= 5	= 17	= 29

1	2-13 = 11	5-13 = 23	8-30 = 0
2	= 10	= 24	= 0
3	= 13	= 22	= 0
4	= 11	= 23	= 0
5	= 11	= 23	= 0

1	2-14 = 19	5-14 = 16	9-29 = 0
2	= 18	= 16	= 0
3	= 20	= 16	= 0
4	= 18	= 16	= 0
5	= 19	= 15	= 0

1	3-22 = 7	5-15 = 7	17-27 = 12
2	= 7	= 7	= 13
3	= 7	= 7	= 13
4	= 9	= 8	= 12
5	= 7	= 6	= 13

1	3-13 = 6	5-16 = 14	18-28 = 14
2	= 5	= 14	= 13
3	= 4	= 14	= 14
4	= 5	= 14	= 13
5	= 5	= 14	= 13



91
[tʃ]

DATA OF MEASUREMENT

	1	1-11 = 4	3-14 = 10	6-15 = 12
	2	= 5	= 10	= 12
	3	= 5	= 8	= 12
	4	= 5	= 9	= 12
	5	= 5	= 9	= 13
	1	2-12 = 3	4-13 = 10	6-16 = 10
	2	= 2	= 10	= 11
	3	= 2	= 11	= 10
	4	= 2	= 10	= 10
	5	= 2	= 12	= 10
	1	12-22 = 2	4-14 = 6	6-17 = 15
	2	= 3	= 6	= 15
	3	= 4	= 6	= 15
	4	= 1	= 6	= 15
	5	= 4	= 7	= 15
	1	2-22 = 5	4-15 = 17	6-18 = 30
	2	= 4	= 16	= 29
	3	= 4	= 16	= 29
	4	= 3	= 17	= 30
	5	= 5	= 17	= 29
	1	2-13 = 11	5-13 = 24	8-30 = 0
	2	= 11	= 23	= 0
	3	= 10	= 23	= 0
	4	= 10	= 24	= 0
	5	= 10	= 23	= 0
	1	2-14 = 20	5-14 = 15	9-29 = 0
	2	= 19	= 15	= 0
	3	= 17	= 16	= 0
	4	= 18	= 16	= 0
	5	= 17	= 16	= 0
	1	3-22 = 8	5-15 = 6	17-27 = 13
	2	= 7	= 5	= 15
	3	= 6	= 5	= 14
	4	= 9	= 6	= 15
	5	= 7	= 6	= 15
	1	3-13 = 4	5-16 = 13	18-28 = 14
	2	= 4	= 12	= 15
	3	= 4	= 11	= 14
	4	= 4	= 12	= 14
	5	= 4	= 12	= 14

DATA OF MEASUREMENT

92

[t̂̂]

1	1-11	= 4	3-14	= 7	6-15	= 17
2		= 4		= 7		= 17
3		= 4		= 6		= 17
4		= 4		= 7		= 17
5		= 5		= 8		= 17

1	2-12	= 3	4-13	= 8	6-16	= 14
2		= 3		= 9		= 15
3		= 3		= 7		= 15
4		= 3		= 7		= 14
5		= 3		= 9		= 14

1	12-22	= 4	4-14	= 4	6-17	= 16
2		= 4		= 4		= 16
3		= 3		= 3		= 17
4		= 3		= 2		= 16
5		= 5		= 4		= 17

1	2-22	= 5	4-15	= 16	6-18	= 30
2		= 5		= 16		= 30
3		= 5		= 16		= 30
4		= 5		= 16		= 30
5		= 5		= 16		= 30

1	2-13	= 13	5-13	= 23	8-30	= 0
2		= 12		= 24		= 0
3		= 13		= 23		= 0
4		= 13		= 23		= 0
5		= 11		= 25		= 0

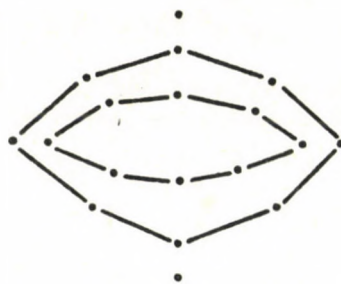
1	2-14	= 18	5-14	= 18	9-29	= 0
2		= 18		= 18		= 0
3		= 19		= 17		= 0
4		= 19		= 17		= 0
5		= 18		= 18		= 0

1	3-22	= 8	5-15	= 7	17-27	= 15
2		= 8		= 7		= 16
3		= 10		= 7		= 16
4		= 10		= 7		= 16
5		= 7		= 6		= 16

1	3-13	= 2	5-16	= 13	18-28	= 14
2		= 3		= 13		= 14
3		= 1		= 13		= 15
4		= 3		= 13		= 16
5		= 2		= 12		= 15

RELATIVE AREAS OF THE OPENING OF THE MOUTH IN PERCENT

WZGLĘDNE POWIERZCHNIE OTWORU WARG W PROCENTACH



Sound	Relative areas in %	Sound	Relative areas in %	Sound	Relative areas in %
1. [a]	1 - 78 2 - 92 3 - 100 4 - 101 5 - 77	8. [õ] +	1 - 86 2 - 100 3 - 100 4 - 99 5 - 99	15. [i]	1 - 67 2 - 93 3 - 100 4 - 98 5 - 108
2. [ã]	1 - 89 2 - 87 3 - 100 4 - 157 5 - 129	9. [u]	1 - 83 2 - 83 3 - 100 4 - 144 5 - 264	16. [ĩ]	1 - 63 2 - 82 3 - 100 4 - 97 5 - 85
3. [æ]	1 - 89 2 - 96 3 - 100 4 - 107 5 - 78	10. [ũ]	1 - 51 2 - 100 3 - 100 4 - 106 5 - 182	17. [e]	1 - 56 2 - 93 3 - 100 4 - 80 5 - 64
4. [æ̃]	1 - 83 2 - 110 3 - 100 4 - 104 5 - 62	11. [u] +	1 - 136 2 - 127 3 - 100 4 - 98 5 - 170	18. [ẽ]	1 - 150 2 - 150 3 - 100 4 - 70 5 - 42
5. [o]	1 - 84 2 - 103 3 - 100 4 - 94 5 - 41	12. [ũ] +	1 - 134 2 - 122 3 - 100 4 - 123 5 - 113	19. [ė]	1 - 74 2 - 93 3 - 100 4 - 102 5 - 71
6. [õ]	1 - 109 2 - 115 3 - 100 4 - 68 5 - 44	13. [±]	1 - 18 2 - 79 3 - 100 4 - 94 5 - 85	20. [ẽ̇]	1 - 127 2 - 127 3 - 100 4 - 100 5 - 107
7. [o] +	1 - 128 2 - 113 3 - 100 4 - 90 5 - 64	14. [±̃]	1 - 115 2 - 112 3 - 100 4 - 103 5 - 106	21. [w]	1 - 287 2 - 143 3 - 100 4 - 63 5 - 154

22. [w] _o	1 - 97 2 - 97 3 - 100 4 - 100 5 - 106	29. [m]	1 - 107 2 - 107 3 - 100 4 - 105 5 - 278	36. [d'']	1 - 69 2 - 96 3 - 100 4 - 133 5 - 163
23. [b]	1 - 85 2 - 85 3 - 100 4 - 101 5 - 864	30. [m] _o	1 - 101 2 - 100 3 - 100 4 - 100 5 - 97	37. [t]	1 - 90 2 - 91 3 - 100 4 - 118 5 - 158
24. [b']	1 - 99 2 - 102 3 - 100 4 - 89 5 - 530	31. [m']	1 - 100 2 - 100 3 - 100 4 - 100 5 - 277	38. [t] _.	1 - 81 2 - 97 3 - 100 4 - 107 5 - 157
25. [b'']	1 - 95 2 - 100 3 - 100 4 - 519 5 - 898	32. [m'']	1 - 98 2 - 94 3 - 100 4 - 98 5 - 254	39. [t']	1 - 105 2 - 101 3 - 100 4 - 134 5 - 130
26. [p]	1 - 96 2 - 90 3 - 100 4 - 101 5 - 504	33. [d]	1 - 133 2 - 116 3 - 100 4 - 145 5 - 211	40. [t'']	1 - 55 2 - 71 3 - 100 4 - 89 5 - 117
27. [p']	1 - 101 2 - 101 3 - 100 4 - 100 5 - 297	34. [d] _.	1 - 93 2 - 97 3 - 100 4 - 101 5 - 112	41. [n]	1 - 71 2 - 84 3 - 100 4 - 138 5 - 140
28. [p'']	1 - 101 2 - 140 3 - 100 4 - 306 5 - 1255	35. [d']	1 - 95 2 - 118 3 - 100 4 - 135 5 - 155	42. [n] _o	1 - 102 2 - 95 3 - 100 4 - 77 5 - 90

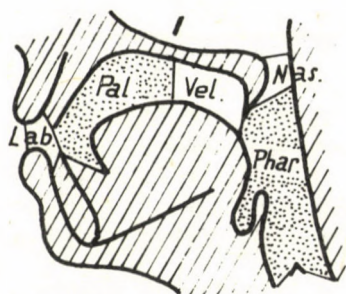
43. [n']	1 - 99	50. [g'']	1 - 117	57. [r'']	1 - 108
	2 - 100		2 - 116		2 - 98
	3 - 100		3 - 100		3 - 100
	4 - 98		4 - 108		4 - 99
	5 - 97		5 - 99		5 - 86
44. [n'']	1 - 85	51. [k]	1 - 84	58. [r' _o ']	1 - 102
	2 - 114		2 - 84		2 - 102
	3 - 100		3 - 100		3 - 100
	4 - 136		4 - 94		4 - 94
	5 - 180		5 - 109		5 - 83
45. [n' _o ']	1 - 98	52. [k']	1 - 100	59. [v]	1 - 56
	2 - 98		2 - 102		2 - 55
	3 - 100		3 - 100		3 - 100
	4 - 116		4 - 117		4 - 94
	5 - 96		5 - 122		5 - 102
46. [ŋ]	1 - 99	53. [k'']	1 - 109	60. [v']	1 - 164
	2 - 101		2 - 100		2 - 161
	3 - 100		3 - 100		3 - 100
	4 - 91		4 - 130		4 - 153
	5 - 68		5 - 146		5 - 139
47. [ŋ']	1 - 93	54. [r]	1 - 102	61. [v'']	1 - 98
	2 - 94		2 - 98		2 - 74
	3 - 100		3 - 100		3 - 100
	4 - 103		4 - 105		4 - 148
	5 - 97		5 - 147		5 - 141
48. [g]	1 - 86	55. [r' _o]	1 - 110	62. [f]	1 - 89
	2 - 91		2 - 100		2 - 101
	3 - 100		3 - 100		3 - 100
	4 - 95		4 - 98		4 - 99
	5 - 103		5 - 98		5 - 106
49. [g']	1 - 84	56. [r']	1 - 115	63. [f']	1 - 89
	2 - 102		2 - 98		2 - 104
	3 - 100		3 - 100		3 - 100
	4 - 91		4 - 115		4 - 76
	5 - 100		5 - 123		5 - 86

64. [f'']	1 - 119 2 - 89 3 - 100 4 - 93 5 - 169	71. [ʒ]	1 - 78 2 - 85 3 - 100 4 - 111 5 - 108	78. [x]	1 - 87 2 - 92 3 - 100 4 - 96 5 - 88
65. [z]	1 - 104 2 - 103 3 - 100 4 - 126 5 - 164	72. [ʃ]	1 - 72 2 - 80 3 - 100 4 - 98 5 - 113	79. [ch']	1 - 91 2 - 96 3 - 100 4 - 101 5 - 90
66. [z']	1 - 105 2 - 91 3 - 100 4 - 105 5 - 140	73. [ʃ']	1 - 88 2 - 85 3 - 100 4 - 123 5 - 143	80. [ch]	1 - 79 2 - 87 3 - 100 4 - 88 5 - 97
67. [s]	1 - 97 2 - 103 3 - 100 4 - 100 5 - 120	74. [ʃ]	1 - 90 2 - 99 3 - 100 4 - 120 5 - 160	81. [1]	1 - 79 2 - 81 3 - 100 4 - 103 5 - 107
68. [s']	1 - 68 2 - 97 3 - 100 4 - 94 5 - 97	75. [j]	1 - 101 2 - 97 3 - 100 4 - 106 5 - 126	82. [1] °	1 - 102 2 - 90 3 - 100 4 - 82 5 - 88
69. [ʒ]	1 - 77 2 - 82 3 - 100 4 - 102 5 - 107	76. [ʒ]	1 - 89 2 - 103 3 - 100 4 - 85 5 - 76	83. [1']	1 - 90 2 - 92 3 - 100 4 - 103 5 - 108
70. [ʒ']	1 - 69 2 - 97 3 - 100 4 - 101 5 - 125	77. [ʒ']	1 - 122 2 - 120 3 - 100 4 - 96 5 - 103	84. [dz]	1 - 84 2 - 67 3 - 100 4 - 63 5 - 58

85. [t _s]	1 - 76	91. [t _ʃ ']	1 - 102
	2 - 74		2 - 98
	3 - 100		3 - 100
	4 - 92		4 - 103
	5 - 109		5 - 116
86. [t _s ']	1 - 86	92. [t _ʃ]	1 - 99
	2 - 77		2 - 100
	3 - 100		3 - 100
	4 - 84		4 - 86
	5 - 105		5 - 113
87. [d _ʒ]	1 - 77		
	2 - 88		
	3 - 100		
	4 - 96		
	5 - 89		
88. [d _ʒ ']	1 - 92		
	2 - 94		
	3 - 100		
	4 - 111		
	5 - 113		
89. [d _ʒ]	1 - 82		
	2 - 82		
	3 - 100		
	4 - 126		
	5 - 125		
90. [t _ʃ]	1 - 82		
	2 - 88		
	3 - 100		
	4 - 107		
	5 - 128		

RELATIVE AREAS OF THE SUPRAGLOTTAL CAVITIES IN PERCENT

WZGLĘDNE POWIERZCHNIE OBSZARÓW NASADY W PROCENTACH



Sound	Relative areas in %					
		Lab.	Pal.	Vel.	Phar.	Nas.
1. [a]	1 --	6 :	34 :	23 :	36 :	0
	2 --	6 :	37 :	23 :	34 :	0
	3 --	7 :	37 :	23 :	33 :	0
	4 --	6 :	38 :	23 :	33 :	0
	5 --	7 :	39 :	22 :	31 :	0
2. [ã]	1 --	7 :	36 :	22 :	34 :	1
	2 --	7 :	38 :	19 :	33 :	3
	3 --	8 :	39 :	20 :	31 :	3
	4 --	8 :	40 :	21 :	28 :	4
	5 --	8 :	40 :	20 :	28 :	4
3. [æ]	1 --	6 :	16 :	26 :	52 :	0
	2 --	6 :	29 :	27 :	38 :	0
	3 --	9 :	39 :	26 :	26 :	0
	4 --	8 :	39 :	26 :	26 :	0
	5 --	8 :	39 :	25 :	29 :	0
4. [æ̃]	1 --	8 :	37 :	16 :	36 :	5
	2 --	9 :	40 :	20 :	28 :	3
	3 --	8 :	39 :	20 :	30 :	5
	4 --	9 :	39 :	18 :	30 :	6
	5 --	6 :	27 :	18 :	44 :	5
5. [o]	1 --	7 :	33 :	10 :	49 :	0
	2 --	7 :	44 :	19 :	30 :	0
	3 --	8 :	46 :	17 :	29 :	0
	4 --	8 :	45 :	18 :	28 :	0
	5 --	8 :	37 :	21 :	34 :	0
6. [õ]	1 --	6 :	40 :	12 :	41 :	1
	2 --	7 :	44 :	15 :	34 :	1
	3 --	6 :	42 :	13 :	36 :	3
	4 --	5 :	42 :	12 :	37 :	4
	5 --	4 :	34 :	17 :	43 :	2
7. [ọ̃]	1 --	6 :	15 :	22 :	57 :	0
	2 --	6 :	28 :	18 :	48 :	0
	3 --	5 :	26 :	20 :	48 :	0
	4 --	5 :	30 :	23 :	42 :	0
	5 --	5 :	33 :	19 :	42 :	0

8. [ẽ] †	1 --	7 :	39 :	19 :	33 :	3
	2 --	6 :	45 :	15 :	29 :	5
	3 --	6 :	46 :	14 :	29 :	6
	4 --	5 :	35 :	18 :	38 :	5
	5 --	4 :	20 :	23 :	51 :	3
9. [u]	1 --	4 :	32 :	9 :	54 :	0
	2 --	4 :	36 :	11 :	49 :	0
	3 --	4 :	41 :	9 :	46 :	0
	4 --	5 :	45 :	9 :	41 :	0
	5 --	5 :	41 :	15 :	40 :	0
10. [ũ]	1 --	5 :	48 :	13 :	32 :	3
	2 --	5 :	47 :	14 :	29 :	5
	3 --	5 :	47 :	12 :	31 :	5
	4 --	6 :	47 :	14 :	29 :	5
	5 --	5 :	40 :	13 :	36 :	6
11. [u] ‡	1 --	5 :	17 :	24 :	54 :	0
	2 --	4 :	30 :	20 :	46 :	0
	3 --	4 :	39 :	16 :	40 :	0
	4 --	4 :	41 :	14 :	40 :	0
	5 --	4 :	35 :	14 :	46 :	0
12. [ũ] †	1 --	4 :	27 :	20 :	48 :	1
	2 --	4 :	29 :	19 :	45 :	3
	3 --	4 :	32 :	20 :	42 :	3
	4 --	4 :	31 :	19 :	43 :	4
	5 --	4 :	38 :	20 :	34 :	5
13. [±]	1 --	5 :	25 :	20 :	50 :	0
	2 --	5 :	23 :	22 :	50 :	0
	3 --	5 :	20 :	21 :	54 :	0
	4 --	5 :	23 :	22 :	50 :	0
	5 --	5 :	20 :	19 :	56 :	0
14. [±] ‡	1 --	4 :	30 :	24 :	42 :	1
	2 --	4 :	29 :	22 :	42 :	3
	3 --	4 :	32 :	21 :	39 :	4
	4 --	4 :	30 :	20 :	41 :	5
	5 --	5 :	32 :	15 :	43 :	6

15. [i]	1 --	5 :	16 :	23 :	56 :	0
	2 --	4 :	14 :	24 :	57 :	0
	3 --	4 :	14 :	24 :	58 :	0
	4 --	4 :	17 :	19 :	60 :	0
	5 --	4 :	15 :	22 :	59 :	0
16. [ĩ]	1 --	4 :	19 :	21 :	56 :	1
	2 --	4 :	17 :	24 :	54 :	1
	3 --	5 :	16 :	26 :	50 :	4
	4 --	4 :	19 :	24 :	50 :	3
	5 --	5 :	18 :	23 :	51 :	4
17. [e]	1 --	5 :	29 :	27 :	39 :	0
	2 --	5 :	29 :	28 :	39 :	0
	3 --	5 :	27 :	26 :	41 :	0
	4 --	5 :	29 :	26 :	40 :	0
	5 --	5 :	26 :	26 :	42 :	0
18. [ě]	1 --	7 :	31 :	14 :	47 :	0
	2 --	8 :	34 :	15 :	42 :	2
	3 --	5 :	36 :	12 :	42 :	5
	4 --	5 :	37 :	12 :	41 :	5
	5 --	4 :	36 :	15 :	43 :	2
19. [ẹ]	1 --	5 :	15 :	20 :	59 :	1
	2 --	6 :	19 :	18 :	57 :	0
	3 --	6 :	23 :	19 :	51 :	0
	4 --	6 :	23 :	19 :	53 :	0
	5 --	5 :	23 :	18 :	53 :	0
20. [ẹ̌]	1 --	7 :	23 :	22 :	44 :	4
	2 --	8 :	26 :	19 :	44 :	4
	3 --	6 :	25 :	19 :	46 :	5
	4 --	6 :	24 :	20 :	44 :	5
	5 --	5 :	21 :	23 :	48 :	3
21. [w]	1 --	6 :	49 :	21 :	24 :	1
	2 --	6 :	50 :	22 :	22 :	0
	3 --	7 :	48 :	23 :	23 :	0
	4 --	7 :	48 :	23 :	23 :	0
	5 --	6 :	50 :	21 :	23 :	0

22. [w]	1 --	5 :	27 :	30 :	38 :	0
	2 --	5 :	31 :	24 :	40 :	0
	3 --	5 :	31 :	24 :	40 :	0
	4 --	6 :	34 :	22 :	38 :	0
	5 --	6 :	36 :	20 :	37 :	0
23. [b]	1 --	3 :	42 :	16 :	38 :	0
	2 --	3 :	44 :	15 :	37 :	0
	3 --	3 :	43 :	15 :	38 :	0
	4 --	4 :	45 :	14 :	37 :	0
	5 --	6 :	48 :	14 :	31 :	0
24. [b']	1 --	3 :	14 :	22 :	61 :	0
	2 --	3 :	14 :	21 :	61 :	0
	3 --	3 :	18 :	18 :	60 :	0
	4 --	4 :	17 :	19 :	60 :	0
	5 --	4 :	18 :	20 :	58 :	0
25. [b'']	1 --	3 :	16 :	20 :	60 :	0
	2 --	3 :	17 :	20 :	59 :	0
	3 --	4 :	14 :	30 :	62 :	0
	4 --	4 :	15 :	20 :	61 :	0
	5 --	3 :	15 :	21 :	61 :	0
26. [p]	1 --	3 :	40 :	17 :	39 :	0
	2 --	3 :	41 :	16 :	40 :	0
	3 --	3 :	42 :	17 :	37 :	0
	4 --	4 :	43 :	16 :	37 :	0
	5 --	5 :	44 :	16 :	34 :	0
27. [p']	1 --	4 :	13 :	22 :	62 :	0
	2 --	3 :	12 :	24 :	60 :	0
	3 --	3 :	16 :	18 :	62 :	0
	4 --	4 :	16 :	18 :	60 :	0
	5 --	4 :	17 :	18 :	61 :	0
28. [p'']	1 --	3 :	12 :	21 :	64 :	1
	2 --	3 :	12 :	22 :	63 :	0
	3 --	3 :	14 :	24 :	59 :	0
	4 --	3 :	11 :	23 :	63 :	0
	5 --	4 :	14 :	23 :	59 :	0

29. [m]	1 --	4 :	45 :	14 :	32 :	5
	2 --	4 :	46 :	16 :	30 :	4
	3 --	4 :	45 :	16 :	32 :	4
	4 --	4 :	47 :	16 :	28 :	5
	5 --	4 :	45 :	16 :	31 :	5
30. [$\frac{m}{o}$]	1 --	4 :	28 :	24 :	41 :	3
	2 --	4 :	28 :	22 :	41 :	4
	3 --	4 :	32 :	20 :	41 :	4
	4 --	4 :	28 :	22 :	42 :	4
	5 --	4 :	29 :	20 :	43 :	4
31. [m']	1 --	4 :	22 :	18 :	52 :	3
	2 --	4 :	17 :	18 :	57 :	4
	3 --	4 :	15 :	21 :	55 :	4
	4 --	4 :	16 :	21 :	55 :	4
	5 --	5 :	18 :	22 :	51 :	3
32. [m'']	1 --	3 :	14 :	18 :	61 :	4
	2 --	3 :	14 :	18 :	61 :	4
	3 --	3 :	14 :	18 :	60 :	5
	4 --	3 :	14 :	18 :	61 :	4
	5 --	4 :	14 :	18 :	61 :	3
33. [d]	1 --	4 :	28 :	21 :	47 :	0
	2 --	3 :	27 :	21 :	49 :	0
	3 --	4 :	26 :	19 :	51 :	0
	4 --	4 :	28 :	19 :	49 :	0
	5 --	5 :	29 :	20 :	45 :	0
34. [d]	1 --	5 :	25 :	27 :	42 :	1
	2 --	5 :	23 :	28 :	44 :	0
	3 --	4 :	24 :	29 :	43 :	0
	4 --	4 :	24 :	28 :	43 :	0
	5 --	5 :	24 :	28 :	43 :	0
35. [d']	1 --	3 :	17 :	25 :	55 :	1
	2 --	3 :	17 :	23 :	57 :	0
	3 --	4 :	13 :	24 :	59 :	0
	4 --	4 :	15 :	24 :	57 :	0
	5 --	5 :	16 :	24 :	55 :	0

36. [d'']	1 --	4 :	23 :	17 :	55 :	1
	2 --	5 :	15 :	24 :	56 :	0
	3 --	5 :	13 :	26 :	56 :	0
	4 --	5 :	12 :	27 :	57 :	0
	5 --	5 :	21 :	21 :	53 :	0
37. [t]	1 --	4 :	28 :	20 :	48 :	0
	2 --	4 :	26 :	20 :	50 :	0
	3 --	3 :	28 :	19 :	49 :	0
	4 --	4 :	28 :	20 :	47 :	0
	5 --	4 :	32 :	18 :	45 :	0
38. [ṭ]	1 --	4 :	24 :	27 :	45 :	1
	2 --	4 :	22 :	27 :	46 :	0
	3 --	5 :	24 :	27 :	44 :	0
	4 --	5 :	24 :	27 :	44 :	0
	5 --	6 :	24 :	26 :	44 :	0
39. [t']	1 --	4 :	21 :	19 :	55 :	1
	2 --	5 :	19 :	18 :	58 :	0
	3 --	4 :	16 :	21 :	59 :	0
	4 --	5 :	15 :	21 :	58 :	0
	5 --	4 :	18 :	20 :	57 :	0
40. [t'']	1 --	5 :	22 :	23 :	49 :	1
	2 --	4 :	20 :	26 :	50 :	0
	3 --	4 :	13 :	27 :	55 :	0
	4 --	4 :	13 :	26 :	56 :	0
	5 --	4 :	14 :	25 :	56 :	0
41. [n]	1 --	3 :	26 :	22 :	42 :	7
	2 --	4 :	27 :	22 :	41 :	6
	3 --	4 :	27 :	22 :	41 :	6
	4 --	6 :	33 :	19 :	35 :	7
	5 --	7 :	38 :	18 :	31 :	7
42. [ṇ]	1 --	4 :	24 :	14 :	48 :	9
	2 --	4 :	25 :	14 :	48 :	9
	3 --	5 :	25 :	13 :	48 :	9
	4 --	5 :	22 :	15 :	50 :	9
	5 --	5 :	22 :	15 :	50 :	9

43. [n']	1 --	5 :	18 :	18 :	49 :	11
	2 --	5 :	14 :	17 :	51 :	12
	3 --	5 :	15 :	18 :	49 :	12
	4 --	4 :	13 :	22 :	54 :	8
	5 --	5 :	12 :	21 :	55 :	7
44. [n'']	1 --	5 :	16 :	21 :	52 :	6
	2 --	5 :	15 :	19 :	53 :	7
	3 --	5 :	12 :	22 :	55 :	6
	4 --	5 :	13 :	22 :	55 :	6
	5 --	5 :	23 :	21 :	49 :	4
45. [n' °]	1 --	6 :	16 :	24 :	52 :	2
	2 --	6 :	14 :	23 :	53 :	4
	3 --	6 :	12 :	23 :	56 :	4
	4 --	5 :	13 :	22 :	51 :	9
	5 --	5 :	17 :	16 :	51 :	11
46. [η]	1 --	7 :	36 :	19 :	33 :	5
	2 --	6 :	30 :	18 :	40 :	7
	3 --	6 :	25 :	16 :	44 :	8
	4 --	5 :	27 :	21 :	41 :	6
	5 --	4 :	28 :	18 :	44 :	5
47. [η']	1 --	4 :	29 :	12 :	48 :	7
	2 --	5 :	25 :	7 :	56 :	7
	3 --	5 :	25 :	7 :	56 :	7
	4 --	5 :	23 :	10 :	55 :	7
	5 --	4 :	24 :	9 :	55 :	7
48. [g]	1 --	7 :	38 :	8 :	46 :	1
	2 --	7 :	39 :	9 :	45 :	0
	3 --	9 :	27 :	15 :	49 :	0
	4 --	8 :	38 :	11 :	43 :	0
	5 --	8 :	43 :	16 :	34 :	0
49. [g']	1 --	5 :	22 :	20 :	52 :	1
	2 --	6 :	19 :	21 :	54 :	0
	3 --	6 :	19 :	15 :	59 :	0
	4 --	5 :	22 :	15 :	57 :	0
	5 --	7 :	18 :	17 :	58 :	0

50. [g'']	1 --	8 :	38 :	16 :	37 :	0
	2 --	7 :	32 :	17 :	43 :	0
	3 --	8 :	29 :	18 :	45 :	0
	4 --	7 :	20 :	26 :	47 :	0
	5 --	7 :	23 :	22 :	47 :	0

51. [k]	1 --	8 :	43 :	7 :	41 :	0
	2 --	8 :	43 :	5 :	43 :	0
	3 --	8 :	44 :	4 :	43 :	0
	4 --	8 :	42 :	6 :	43 :	0
	5 --	10 :	43 :	6 :	40 :	0

52. [k']	1 --	5 :	18 :	19 :	57 :	0
	2 --	5 :	22 :	19 :	53 :	0
	3 --	6 :	21 :	20 :	53 :	0
	4 --	5 :	20 :	17 :	57 :	0
	5 --	5 :	21 :	18 :	56 :	0

53. [k'']	1 --	6 :	28 :	16 :	49 :	0
	2 --	5 :	25 :	16 :	53 :	0
	3 --	6 :	22 :	19 :	53 :	0
	4 --	6 :	22 :	18 :	54 :	0
	5 --	5 :	28 :	17 :	49 :	0

54. [r]	1 --	5 :	33 :	21 :	40 :	1
	2 --	5 :	29 :	23 :	43 :	0
	3 --	6 :	30 :	21 :	42 :	0
	4 --	6 :	31 :	22 :	41 :	0
	5 --	7 :	38 :	16 :	39 :	0

55. [r] °	1 --	7 :	24 :	18 :	51 :	0
	2 --	7 :	25 :	19 :	48 :	0
	3 --	7 :	28 :	20 :	45 :	0
	4 --	6 :	29 :	18 :	46 :	0
	5 --	7 :	27 :	19 :	46 :	0

56. [r']	1 --	5 :	25 :	20 :	49 :	1
	2 --	5 :	23 :	24 :	48 :	0
	3 --	5 :	23 :	23 :	48 :	0
	4 --	6 :	23 :	22 :	47 :	0
	5 --	6 :	25 :	23 :	46 :	0

57. [r'']	1 --	7 :	34 :	26 :	33 :	0
	2 --	6 :	27 :	25 :	42 :	0
	3 --	6 :	24 :	25 :	45 :	0
	4 --	6 :	18 :	26 :	50 :	0
	5 --	6 :	22 :	25 :	46 :	0
58. [r'] °	1 --	6 :	27 :	20 :	47 :	0
	2 --	5 :	27 :	20 :	47 :	0
	3 --	5 :	23 :	21 :	50 :	0
	4 --	5 :	17 :	25 :	52 :	0
	5 --	6 :	19 :	24 :	50 :	0
59. [v]	1 --	4 :	36 :	21 :	39 :	0
	2 --	3 :	38 :	20 :	39 :	0
	3 --	2 :	41 :	19 :	37 :	0
	4 --	3 :	40 :	18 :	38 :	0
	5 --	4 :	40 :	20 :	35 :	0
60. [v']	1 --	4 :	17 :	25 :	54 :	0
	2 --	4 :	14 :	27 :	55 :	0
	3 --	3 :	13 :	26 :	57 :	0
	4 --	3 :	14 :	26 :	56 :	0
	5 --	4 :	14 :	26 :	56 :	0
61. [v'']	1 --	3 :	24 :	22 :	50 :	0
	2 --	3 :	20 :	21 :	55 :	0
	3 --	2 :	16 :	23 :	59 :	0
	4 --	4 :	15 :	23 :	57 :	0
	5 --	4 :	18 :	21 :	57 :	0
62. [f]	1 --	5 :	38 :	22 :	34 :	0
	2 --	4 :	42 :	20 :	34 :	0
	3 --	3 :	42 :	20 :	34 :	0
	4 --	4 :	44 :	20 :	31 :	0
	5 --	5 :	42 :	20 :	32 :	0
63. [f']	1 --	4 :	23 :	20 :	52 :	0
	2 --	4 :	21 :	21 :	53 :	0
	3 --	3 :	20 :	20 :	56 :	0
	4 --	4 :	18 :	23 :	54 :	0
	5 --	4 :	20 :	23 :	52 :	0

64. [f'']	1 --	4 :	25 :	21 :	49 :	0
	2 --	4 :	21 :	21 :	54 :	0
	3 --	3 :	21 :	22 :	55 :	0
	4 --	4 :	19 :	21 :	56 :	0
	5 --	5 :	22 :	22 :	51 :	0
65. [z]	1 --	4 :	28 :	26 :	42 :	0
	2 --	4 :	29 :	26 :	41 :	0
	3 --	4 :	29 :	25 :	41 :	0
	4 --	4 :	31 :	25 :	39 :	0
	5 --	4 :	31 :	24 :	41 :	0
66. [z']	1 --	3 :	29 :	22 :	44 :	1
	2 --	3 :	23 :	24 :	49 :	0
	3 --	4 :	22 :	25 :	49 :	0
	4 --	4 :	18 :	24 :	54 :	0
	5 --	4 :	19 :	24 :	53 :	0
67. [s]	1 --	3 :	29 :	25 :	42 :	1
	2 --	4 :	28 :	25 :	43 :	0
	3 --	4 :	31 :	25 :	40 :	0
	4 --	3 :	31 :	24 :	41 :	0
	5 --	4 :	35 :	20 :	41 :	0
68. [s']	1 --	4 :	25 :	24 :	47 :	0
	2 --	4 :	24 :	24 :	47 :	0
	3 --	5 :	26 :	18 :	51 :	0
	4 --	4 :	26 :	20 :	50 :	0
	5 --	4 :	27 :	18 :	52 :	0
69. [ʒ]	1 --	6 :	28 :	15 :	50 :	1
	2 --	6 :	27 :	17 :	49 :	0
	3 --	5 :	25 :	20 :	49 :	0
	4 --	5 :	29 :	17 :	48 :	0
	5 --	5 :	33 :	15 :	47 :	0
70. [ʒ']	1 --	5 :	29 :	14 :	52 :	0
	2 --	4 :	25 :	15 :	55 :	0
	3 --	4 :	24 :	14 :	57 :	0
	4 --	4 :	24 :	16 :	55 :	0
	5 --	4 :	23 :	17 :	54 :	0

71. [ʒ]	1 --	4 :	14 :	19 :	62 :	1
	2 --	4 :	15 :	16 :	64 :	0
	3 --	3 :	17 :	18 :	61 :	0
	4 --	4 :	15 :	19 :	62 :	0
	5 --	4 :	16 :	20 :	59 :	0
72. [ʃ]	1 --	5 :	28 :	20 :	46 :	0
	2 --	5 :	32 :	19 :	43 :	0
	3 --	5 :	31 :	17 :	46 :	0
	4 --	6 :	31 :	19 :	43 :	0
	5 --	7 :	32 :	18 :	43 :	0
73. [ʃ']	1 --	6 :	37 :	19 :	38 :	0
	2 --	6 :	33 :	21 :	40 :	0
	3 --	6 :	28 :	21 :	45 :	0
	4 --	6 :	31 :	20 :	43 :	0
	5 --	5 :	30 :	22 :	43 :	0
74. [ɸ]	1 --	4 :	15 :	20 :	61 :	0
	2 --	4 :	17 :	24 :	55 :	0
	3 --	4 :	14 :	22 :	60 :	0
	4 --	4 :	13 :	22 :	61 :	0
	5 --	4 :	13 :	23 :	60 :	0
75. [j]	1 --	4 :	17 :	22 :	56 :	1
	2 --	5 :	15 :	23 :	57 :	0
	3 --	5 :	14 :	22 :	59 :	0
	4 --	6 :	16 :	22 :	56 :	0
	5 --	6 :	21 :	21 :	52 :	0
76. [ʒ]	1 --	5 :	28 :	18 :	48 :	0
	2 --	6 :	27 :	17 :	49 :	0
	3 --	7 :	18 :	19 :	55 :	0
	4 --	7 :	18 :	19 :	55 :	0
	5 --	7 :	17 :	22 :	54 :	0
77. [ʒ']	1 --	6 :	42 :	18 :	34 :	0
	2 --	7 :	29 :	18 :	45 :	0
	3 --	7 :	19 :	19 :	54 :	0
	4 --	7 :	18 :	20 :	54 :	0
	5 --	5 :	20 :	21 :	53 :	0

78. [x]	1 --	9 :	45 :	19 :	26 :	1
	2 --	9 :	46 :	20 :	25 :	0
	3 --	9 :	47 :	19 :	25 :	0
	4 --	9 :	47 :	19 :	25 :	0
	5 --	10 :	48 :	20 :	21 :	0
79. [ch']	1 --	9 :	33 :	21 :	36 :	1
	2 --	8 :	32 :	21 :	38 :	0
	3 --	8 :	34 :	22 :	35 :	0
	4 --	8 :	34 :	23 :	34 :	0
	5 --	8 :	34 :	21 :	37 :	0
80. [ch]	1 --	7 :	21 :	20 :	51 :	1
	2 --	6 :	24 :	21 :	48 :	0
	3 --	6 :	21 :	19 :	53 :	0
	4 --	6 :	21 :	20 :	53 :	0
	5 --	6 :	21 :	19 :	53 :	0
81. [1]	1 --	7 :	30 :	24 :	37 :	1
	2 --	7 :	30 :	23 :	39 :	0
	3 --	8 :	28 :	23 :	40 :	0
	4 --	8 :	32 :	24 :	35 :	0
	5 --	8 :	35 :	22 :	34 :	0
82. [1 _o]	1 --	6 :	20 :	25 :	48 :	0
	2 --	6 :	19 :	23 :	51 :	0
	3 --	7 :	24 :	24 :	45 :	0
	4 --	7 :	25 :	22 :	46 :	0
	5 --	8 :	24 :	21 :	46 :	0
83. [1']	1 --	5 :	27 :	22 :	46 :	0
	2 --	5 :	19 :	23 :	52 :	0
	3 --	6 :	17 :	23 :	53 :	0
	4 --	5 :	16 :	23 :	55 :	0
	5 --	6 :	17 :	24 :	52 :	0
84. [dz]	1 --	4 :	25 :	23 :	47 :	1
	2 --	4 :	25 :	27 :	44 :	0
	3 --	4 :	26 :	25 :	44 :	0
	4 --	4 :	28 :	24 :	43 :	0
	5 --	3 :	29 :	26 :	41 :	0

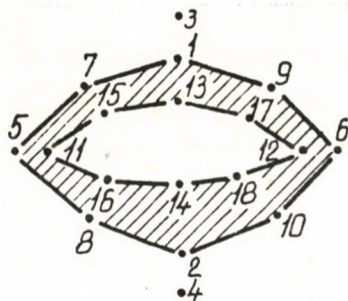
85. [t _s]	1 --	3 :	30 :	24 :	41 :	1
	2 --	4 :	29 :	25 :	42 :	0
	3 --	4 :	29 :	25 :	41 :	0
	4 --	4 :	29 :	26 :	41 :	0
	5 --	5 :	32 :	25 :	38 :	0
86. [t _s ']	1 --	4 :	24 :	24 :	47 :	0
	2 --	4 :	23 :	25 :	48 :	0
	3 --	4 :	23 :	24 :	48 :	0
	4 --	4 :	23 :	24 :	48 :	0
	5 --	5 :	23 :	24 :	48 :	0
87. [d ₃]	1 --	5 :	23 :	21 :	50 :	0
	2 --	6 :	25 :	20 :	49 :	0
	3 --	6 :	23 :	21 :	50 :	0
	4 --	6 :	24 :	21 :	49 :	0
	5 --	5 :	24 :	23 :	47 :	0
88. [d ₃ ']	1 --	4 :	22 :	20 :	53 :	0
	2 --	5 :	20 :	20 :	54 :	0
	3 --	5 :	20 :	21 :	54 :	0
	4 --	5 :	20 :	23 :	52 :	0
	5 --	4 :	22 :	22 :	51 :	0
89. [d ₄]	1 --	5 :	14 :	24 :	57 :	0
	2 --	5 :	16 :	24 :	54 :	0
	3 --	4 :	16 :	21 :	58 :	0
	4 --	5 :	12 :	22 :	60 :	0
	5 --	5 :	15 :	22 :	56 :	0
90. [t _f]	1 --	4 :	24 :	21 :	50 :	0
	2 --	5 :	23 :	22 :	49 :	0
	3 --	5 :	23 :	21 :	50 :	0
	4 --	5 :	25 :	22 :	48 :	0
	5 --	5 :	25 :	20 :	50 :	0

91. [$\hat{t}f'$]	1 --	5 :	22 :	20 :	53 :	0
	2 --	5 :	17 :	19 :	58 :	0
	3 --	5 :	19 :	19 :	56 :	0
	4 --	5 :	19 :	19 :	56 :	0
	5 --	5 :	22 :	17 :	55 :	0

92. [$\hat{t}g$]	1 --	5 :	17 :	23 :	55 :	0
	2 --	5 :	16 :	24 :	55 :	0
	3 --	5 :	15 :	24 :	56 :	0
	4 --	5 :	15 :	23 :	57 :	0
	5 --	5 :	15 :	24 :	55 :	0

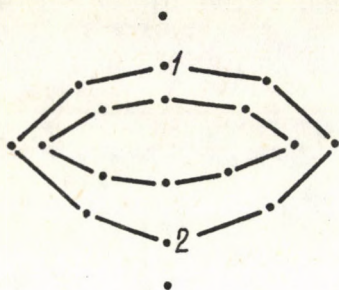
THE ORDER OF POLISH SPEECH SOUNDS ACCORDING TO THE DISTANCE
BETWEEN MEASUREMENT POINTS CORRESPONDING TO THE MAIN
ARTICULATORY POSITION OF THE LIPS

KOLEJNOŚĆ GŁOSEK POLSKICH WEDŁUG ODLEGŁOŚCI MIĘDZY PUNKTAMI
WYRAŻAJĄCYMI GŁÓWNE POZYCJE ARTYKULACYJNE WARG



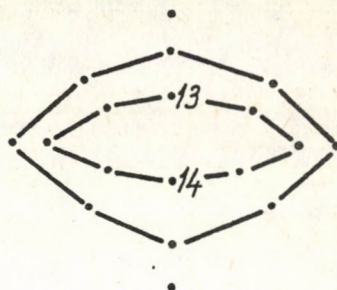
1. The order of vowels / Kolejność samogłosek

1--2



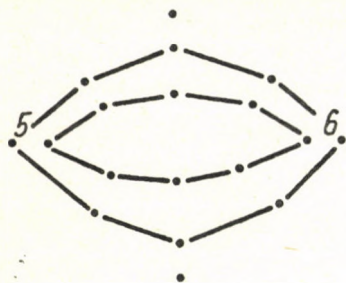
19 mm	ĩ, ï, ě
20 mm	ã, õ +
21 mm	u, ı, ě, w, ʋ
22 mm	ũ, ũ, i +
24 mm	õ, o, u, e +
25 mm	a, æ, æ̃
26 mm	o, e

13--14



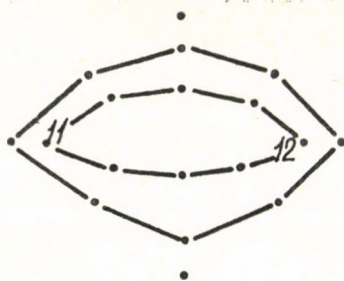
3 mm	u, ě
4 mm	ũ, u, ũ, w +
5 mm	ĩ, w
6 mm	õ +
7 mm	ã, ï
8 mm	ı, i, ě
9 mm	õ, o +
10 mm	æ̃, o, e
11 mm	a, æ
12 mm	e

5--6



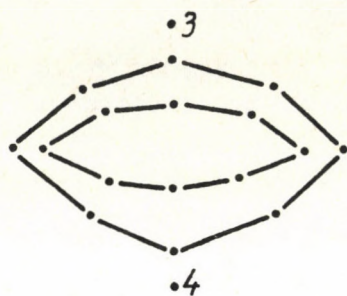
36 mm	u, ũ, u ₊
38 mm	w
39 mm	ũ ₊
40 mm	o, õ, w _o
42 mm	ã, æ, o ₊ , ĩ,
	ẽ, e, ẽ
43 mm	õ ₊
44 mm	a, ã, ẽ,
	i, e
45 mm	ɛ

11--12



9 mm	u ₊
10 mm	u
11 mm	ũ, w _o
13 mm	ũ ₊
18 mm	õ, ẽ ₊
20 mm	ĩ, w
22 mm	o ₊
25 mm	i
26 mm	o, õ, ẽ
28 mm	ã, ɛ
30 mm	ẽ
31 mm	æ
32 mm	e
34 mm	e ₊
36 mm	ã
37 mm	a

3--4



56 mm \tilde{e} , w
 \circ

57 mm u
 $+$

58 mm \tilde{o}
 $+$

59 mm \tilde{u}
 $+$

60 mm u

61 mm \tilde{a} , o

62 mm i, \tilde{i}

63 mm \tilde{e}

64 mm \tilde{o} , \tilde{z} , \tilde{z}

65 mm æ, \tilde{u}

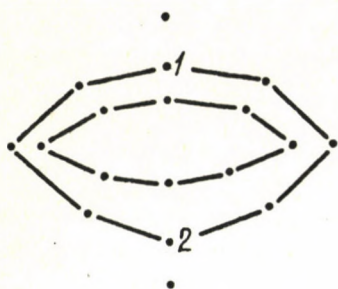
66 mm $\tilde{æ}$, o, e
 $,$

67 mm a, e

68 mm w

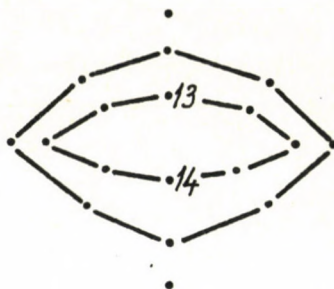
2. The order of consonants / Kolejność spółgłosek

1--2



15 mm	b, m''
16 mm	b', m, m'
17 mm	p, m, v, f'
18 mm	b'', p', p'', d', n, v', v'', f, z, z', s
19 mm	d, t, t', n, n', ŋ', g', f'', ts
20 mm	t'', n', k', r, r', s', dz, ts', dʒ'
21 mm	d, d'', n'', g, g', k'', r', ʃ, ʒ', ch', l, l', dʒ, dʒ'

13--14



0 mm	b, b', b'', p p', p'', m, m' m', m''
3 mm	v', v'', f''
4 mm	d, v, f, f', z
5 mm	d', t', n, n', ŋ', z', s, s', dz
6 mm	t, n, n', r, r', ʃ, l', ts
7 mm	d'', n'', g', k', k'', r', ʃ, j ʒ', ch, l, ts',

22 mm η , r'' , \mathfrak{z}' , j , $t\hat{f}'$,
 $t\hat{e}$

23 mm r , \mathfrak{z} , $t\hat{f}$

24 mm t , \mathfrak{z} , \mathfrak{f} , \mathfrak{f}' , l

25 mm k , ch

28 mm x

$d\hat{g}'$, $d\hat{z}$

8 mm d , t'' , η , g ,

g'' , r , r'' , \mathfrak{z}' ,

$t\hat{e}$

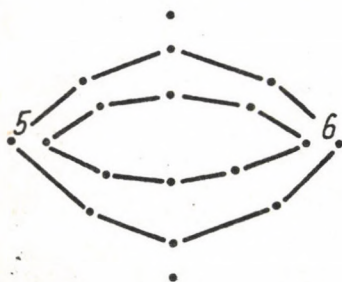
9 mm \mathfrak{z} , \mathfrak{f}' , $d\hat{g}$, $t\hat{f}'$

10 mm t , \mathfrak{f} , l , $t\hat{f}$

11 mm k , \mathfrak{z} , ch

13 mm x

5--6



38 mm b

39 mm m

40 mm p

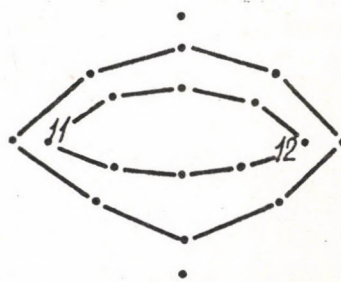
41 mm b' , b'' , \mathfrak{z}' , \mathfrak{f}' ,

j , \mathfrak{f} , x

42 mm p' , p'' , m' , m'' ,

d , η , η' , k , k' ,

11-12



15 mm p' , f''

16 mm p'' , m , v''

17 mm p

19 mm b , b' , b'' , v'

20 mm v

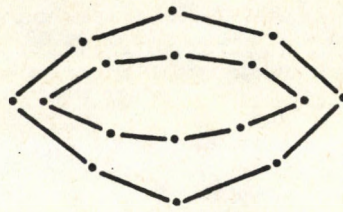
21 mm m'' , f

22 mm m , m' , d' , η'

	k'', r, r'', v, v'',	23 mm	n', f', z, ɸ,
	z', ʃ, ʒ, ʃ, ɸ,		ts'
	ʃ', ch', l, l, l',	24 mm	d, t', z', ʒ',
	dʒ', dʒ̣, tʃ, tʃ̣		ʃ', dʒ̣, ,
43 mm	d, d'', t, ṭ, t',	25 mm	s', dʒ̣
	t'', n, n', n'', ṇ',	26 mm	d, n'', ʒ, ʃ, ḷ,
	g, g', g'', ṛ, r',		ts, dʒ', tʃ,
	r', v', f, f', f'',		tʃ',
	z, s, s', ch, ts,	27 mm	t, ṭ, ʒ, j
	ts', dʒ̣, tʃ'		ʃ, dz,
44 mm	m, d', ṇ, dẓ	28 mm	ṇ, n', k', ṛ,
			r', ʃ'
		29 mm	d'', k'', ṛ', l'
		30 mm	g', s, ch'
		31 mm	ch
		32 mm	t'', g'', r, l
		34 mm	r'', x
		35 mm	ŋ, k
		36 mm	g

3--4

•3

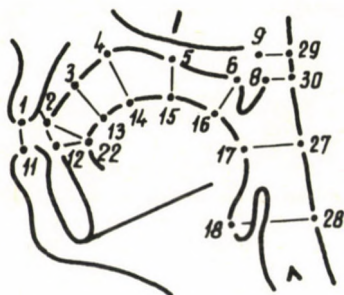


•4

57 mm	m, m'', d, d', n', f', d̂	61 mm	d'', t'', n, η, g, k', v, z', f, j, ch'
58 mm	m, m', t, v'', f', ts, t̂	62 mm	b'', η, g, g'', k'', r, r', l'
59 mm	b, p', t, n, r, r', v', f, z, s', γ', dz, ts', d̂', d̂z, t̂f'	63 mm	b', p, d
60 mm	p'', t', n', n'', f'', s, 3, 3', 4, φ, γ, 1, t̂f	64 mm	r'',
		65 mm	k, l
		66 mm	ch
		67 mm	x

THE ORDER OF POLISH SPEECH SOUNDS ACCORDING TO THE DISTANCE
BETWEEN MEASUREMENT POINTS CORRESPONDING TO THE MAIN
ARTICULATORY POSITIONS OF THE SUPRAGLOTTAL CAVITIES

KOLEJNOŚĆ GŁOSEK POLSKICH WEDŁUG ODLEGŁOŚCI MIĘDZY PUNKTAMI
WYRAŻAJĄCYMI GŁÓWNE POZYCJE ARTYKULACYJNE NASADY



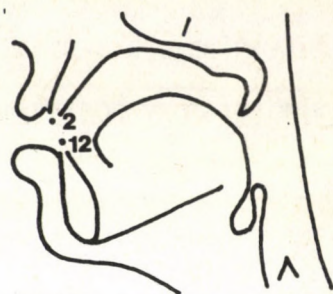
1. The order of vowels / Kolejność samogłosek

1--11



1 mm	ũ, u, w
2 mm	u, ũ ₊
3 mm	o, ɤ̃, i, ẽ, w
4 mm	õ, ɨ, ĩ, ẽ
5 mm	õ, e, ɐ
6 mm	ã, o
7 mm	a, ă
8 mm	æ

2--12



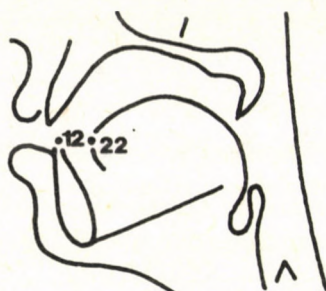
2 mm	u ₊
3 mm	i, w _o
4 mm	o, õ ₊ , u, ũ, ũ ₊ , ɤ̃, ĩ, ẽ
5 mm	o, i, e
6 mm	æ, ã, e, ɐ
7 mm	ã, o
8 mm	a, w

2--22



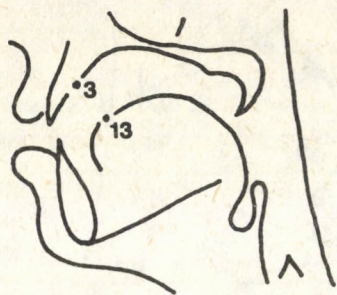
5 mm	i
7 mm	ĩ, w _o
9 mm	æ, ɤ, e, ẽ
10 mm	a, c ₊ , e
11 mm	ã, ù ₊
12 mm	ã, ɤ, ẽ
13 mm	o, õ
15 mm	õ ₊ , w
16 mm	u, u ₊
18 mm	ũ

12--22



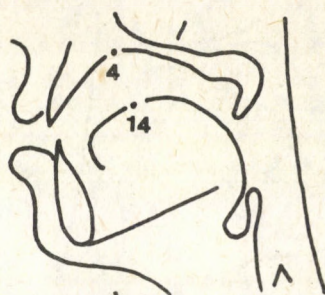
3 mm	i
4 mm	a, e
5 mm	æ, ã, e, ẽ
6 mm	ɤ
7 mm	ã, o ₊ , w _o
8 mm	ã, o, õ, ù ₊ , ɤ
10 mm	ẽ
12 mm	õ ₊ , w
14 mm	u ₊
15 mm	u, ù

3--13



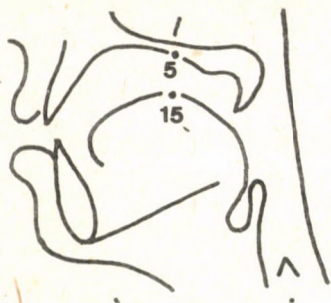
3 mm	i, w o
4 mm	ĩ
6 mm	ɪ, e
7 mm	ẽ
8 mm	o, ɪ̃, e +
10 mm	ã, ã̃ +
11 mm	æ, æ̃, õ, ẽ
12 mm	a, u +
13 mm	o, õ +
14 mm	u, w
15 mm	ũ

4--14



3 mm	i
4 mm	ĩ
6 mm	ɪ
7 mm	e, ẽ
9 mm	o, ɪ̃, ẽ, w +
10 mm	æ̃, u, ã̃, e +
13 mm	ã, æ, õ
14 mm	a, õ, u, u +
15 mm	o, w

5--15



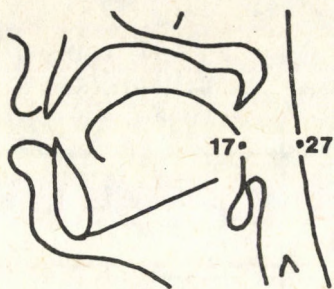
3 mm	u ₊
4 mm	ĩ, ě
5 mm	ı, i, ě
6 mm	o ₊ , u, ũ ₊ , e ₊ , w _o
7 mm	ã, u, i
8 mm	o, õ
9 mm	õ, e
10 mm	æ, w
11 mm	a, ă

6--16



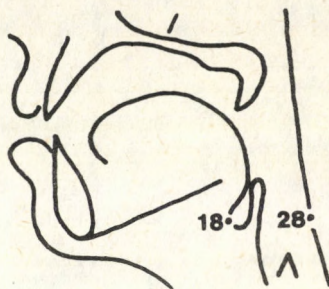
4 mm	õ, u, ũ
6 mm	õ ₊ , ě
7 mm	æ, o, u ₊ , w
8 mm	w _o
9 mm	ũ ₊ , e ₊
10 mm	a, ã, ě
11 mm	ĩ
12 mm	a, o ₊ , ĩ
13 mm	ı
14 mm	i
19 mm	e

17--27



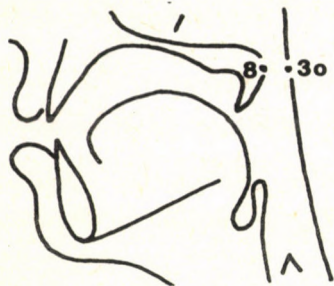
4 mm	æ, o, ẽ
5 mm	a ă
6 mm	a, u, ỹ
7 mm	ă, ẽ, w
9 mm	u ₊
10 mm	w _o
11 mm	ẽ
12 mm	ỹ ₊
13 mm	ĩ, e
14 mm	ĩ
15 mm	ĩ, e, ẽ
16 mm	o ₊ , i

18--28



7 mm	w
8 mm	o
9 mm	ẽ, ỹ, w _o
11 mm	æ
12 mm	ă, ă, ẽ
13 mm	a, u, ỹ, ĩ, e
14 mm	ẽ, ẽ
15 mm	u, ỹ
16 mm	o ₊
18 mm	ĩ, i, ẽ

8--30



0 mm a, æ, o, $\underset{+}{o}$,

u, $\underset{+}{u}$, \ddot{x} , i

e, $\underset{+}{e}$, w, $\underset{o}{w}$

3 mm \tilde{a} , \tilde{o} , \tilde{u} ,

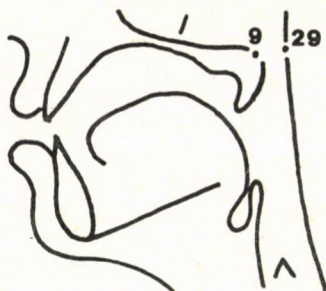
\tilde{x} , \tilde{i}

4 mm \tilde{a} , \tilde{e}

5 mm \tilde{o} , \tilde{e}

11 mm \tilde{u}

9--29



0 mm a, æ, $\underset{+}{o}$, u

$\underset{+}{u}$, \ddot{x} , i, $\underset{+}{e}$

w, $\underset{o}{w}$

1 mm o, e

3 mm \tilde{a} , \tilde{o} , \tilde{u} , \tilde{x}

4 mm \tilde{i} , \tilde{e} , \tilde{a}

5 mm \tilde{o} , \tilde{u}

6 mm \tilde{e}

2. The order of consonants / Kolejność spółgłosek

1--11



0 mm b, b', b'', p,
p', p'', m, m', m''

1 mm m, v, v'

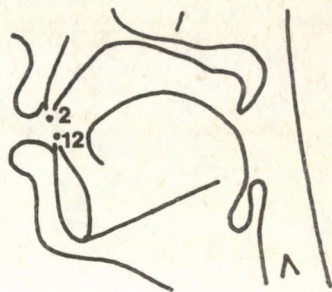
2 mm d, d', t, t', ŋ,
ŋ', v'', f, f', f'',
dz

3 mm d'', t'', n, n'', z,
z', s, s', ʒ',
tʃ

4 mm t̪, n', ŋ, g', k',
k'', r', r'', ʒ, ʃ,
ʃ', ʧ, ʤ, l', tʃ',
dʒ', dʒ̥, tʃ̥, tʃ̥̥

5 mm d̪, ŋ̊, r, r̊, r', j,

2--12



1 mm d̪, z', tʃ, dʒ',
dʒ̥

2 mm t, t', d, n'
z, s, ʒ, ʒ',
ʒ̥, ʧ, ʤ', dʒ,
tʃ', dʒ', tʃ̥'

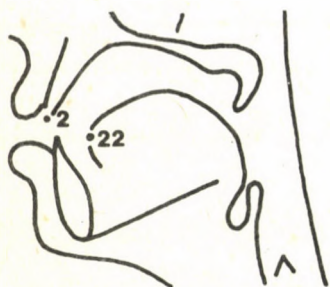
3 mm b, b'', p, p',
p'', m̊, m'', d'
t, t'', n, v,
v'', s', ʃ, j,

tʃ̥, tʃ̥̥
4 mm b', m', d'', ŋ̊,
ŋ, ŋ', g', k'
k'', r̊, r', r̊',

$\hat{d}\hat{z}$, $\hat{t}\hat{f}'$
 6 mm k, γ' , ch' , l_0
 7 mm g, ch
 8 mm g'' , l
 9 mm x

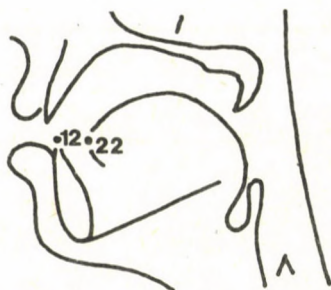
v' , f' , f'' , l_0 ,
 γ' , γ , ch' , l'
 5 mm m, r, r'' , f
 6 mm g'' , l
 7 mm k
 8 mm g, ch
 9 mm x

2--22



2 mm $\hat{d}\hat{z}$, $\hat{t}\hat{f}$,
 3 mm n_0 , z' , z , $\hat{d}\hat{z}'$,
 $\hat{t}\hat{f}'$
 4 mm d , t' , s' , z' ,
 $\hat{d}\hat{z}$
 5 mm b'' , m' , m'' , d' , t'' ,
 n'' , n_0' , r, s, φ ,

12--22



1 mm $\hat{d}\hat{z}'$
 2 mm n'' , z , z' , $\hat{d}\hat{z}$,
 $\hat{t}\hat{f}'$, $\hat{t}\hat{f}$, z'
 3 mm b'' , m'' , z' , φ ,
 $\hat{d}\hat{z}$, $\hat{t}\hat{f}$
 4 mm p'' , m_0 , m' , d,
 t' , t'' , n' ,

	γ, t̂		n', η, f'', s,
6 mm	p', p'', m, d'', t, t,		s', γ', l
	n', η, v', z, l, dz,	5 mm	d', t, t, v',
	ts, ts'		dz, ts'
7 mm	d, n, r', v'', f', γ'	6 mm	b', p', d'', n,
8 mm	b', r, r'', f', f'',		g, r, r', v'',
	ʒ, j, l'		f', z, f', j,
9 mm	g, r', f		γ', ch, ts
10 mm	η', k', ch'	7 mm	d, x
11 mm	g', k''	8 mm	η', k', r, r',
12 mm	ch, l		ʒ, f
13 mm	b, p, v	9 mm	g', k'', ch, l'
14 mm	g'', f, x	10 mm	b, v, f
15 mm	m	11 mm	p, m
19 mm	k	12 mm	g'', r''
		15 mm	l
		16 mm	k



0 mm	n', l
1 mm	b'', p'', m'', d', t'', n'', n', v', ɸ, j, ʃ', l', t̂ɸ
2 mm	p', m', d'', t', v'', ɣ,
3 mm	d̂ɸ
4 mm	b', d, d̂, t, t̂, n, ŋ, k', r'', r', f', f'', z, ʒ, l̂, d̂ʒ', t̂ʃ, t̂ʃ'
5 mm	m̂, g', r, r', ʃ', ch', d̂ʒ
6 mm	ŋ', g, k'', r̂, z, ʒ', ts, ts'
7 mm	ŋ̂, s, s', ʃ, dz

2 mm	b'', p'', n', j
3 mm	d'', t'', g', v', ɤ, ɸ, t̂ɸ
4 mm	b', p', m', m'' d', t', n', n'' k', k'', v'', f' f'', ɣ, ʃ', ch', l', d̂ɸ
5 mm	l̂
6 mm	ŋ', g, g'', r̂' t̂ʃ'
7 mm	r'', z', ʒ', l, d̂ʒ'
8 mm	d̂, ŋ, r̂, ʒ, ts', d̂ʒ, t̂ʃ
9 mm	m̂, t, k, r',

8 mm ch
 10 mm b, g"
 11 mm p, v
 13 mm m, k, f, x

s', ʃ, ʃ'
 10 mm d, t, n, ŋ,
 ch, dz
 12 mm z, s, ts
 13 mm b, r, v, f
 14 mm m, x
 15 mm p

5--15



6--16

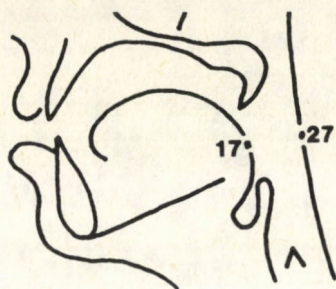


0 mm g, g"
 1 mm ŋ', g', k, k"
 2 mm k', r', ʒ, ʒ',
 ch'
 3 mm j
 4 mm p', m', d', n'
 5 mm b', b'', d'', t', ŋ,

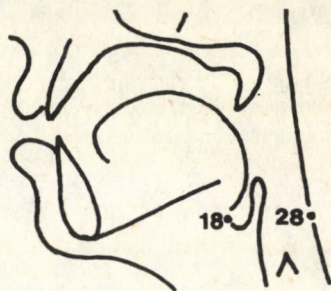
2 mm ŋ', k
 6 mm ʒ', n
 7 mm b, m, ŋ, g,
 ʒ, ʒ'
 8 mm p, m, d, t,
 n', g', k', v,
 s', ʒ, ʃ'

	n', n'', r, v'', f',	9 mm	k'', r, f, ʒ,
	f'', ʒ', ʒ, l, l', tʃ'		ʃ, x
6 mm	r', r'', s', ʒ, ʃ',	10 mm	n'', g'', r, r',
	ʃ, dʒ		j, ʧ', tʃ'
7 mm	b, p'', m, m'', d, t,	11 mm	b'', p', m', n,
	v', z', ʃ, ʧ, l,		n'', r', v'', f'
	tʃs', dʒ, dʒ', tʃ,		f'', l, l, dʒ,
	tʃ		tʃ
8 mm	p, d, ɲ, r, v, f	12 mm	t', z, ʧ,
9 mm	t, dz, ts		tʃs', dʒ'
10 mm	m, n	13 mm	b', t, t'', r'',
11 mm	z, s, x		z', s, ʃ, l',
			dz, ts, dʒ
		14 mm	d, d', v'
		15 mm	m'', d'', tʃ
		16 mm	p''

17--27



18--28



7 mm	f, x	6 mm	x
8 mm	p, m, v, ʒ	8 mm	m
9 mm	b, m, k	9 mm	b, f
10 mm	g, r, ʃ, ʃ', ʒ, ʒ'	10 mm	m, d, n, ɳ, v
11 mm	r, z, s, s', l	11 mm	p, k, r, s, ʒ, ch, l, ts
12 mm	d, t, n, k', r', r'', z', ʒ', ch, l	12 mm	t, t, g'', r, z ʃ', ʒ, ʒ', l, dʒ
13 mm	d, n, ɳ, ɳ', g'', r', f'', ts, tʃ	13 mm	d, k', r', z', ʒ', dz
14 mm	p', t, g', k'', dz, ts', dʒ, dʒ', tʃ'	14 mm	b'', n, ɳ', g k'', ts', dʒ', tʃ, tʃ'
15 mm	b'', d', d'', t'', n', v'', ʒ, j, ch, l'	15 mm	n', r'', l', tʃ
16 mm	t', n', f', , t	16 mm	m', t'', n', g'
17 mm	b', m', v'		r', f', f'', s', ʒ

18 mm p'', n'', d̂z̄

19 mm m''

17 mm b', p', p'', m''

d'', v', v'', ɸ

j, ch', d̂z̄

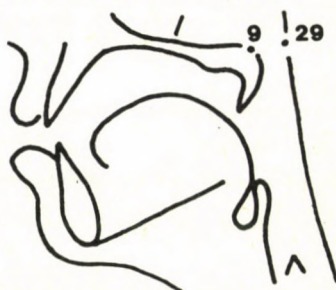
18 mm d', n''

19 mm t'

8--30



9--29



0 mm b, b', b'', p, p',
p'', d, d̂, d', d'',
t, t̂, t', t'', g,
g', g'', k, k', k'',
r, r̂, r', r'', r̂',
v, v', v'', f, f',
f'', z, z', s, s',
ʒ, ʒ', z̄, ʃ, ʃ', ɸ,
j, ʃ, ʃ', x, ch, l, l̂,
l', dz, ts, ts', d̂z̄,

0 mm b, b', b'', p,
p', p'', d, d̂,
d', d'', t, t̂,
t', t'', g, g',
g'', k, k', k'',
r, r̂, r', r'',
r̂', v, v', v'',
f, f', f'', z,
z', s, s', ʒ,
ʒ', z̄, ʃ, ʃ',

	$\hat{d}\hat{z}, \hat{t}\hat{f}, \hat{t}\hat{f}', t\varphi$		$\hat{c}, j, \hat{v}, \hat{v}',$
1 mm	$\hat{d}\hat{z}'$		$\hat{c}h, l, \hat{l}, l',$
3 mm	m, m_{\circ}, n'_{\circ}		$\hat{d}z, t\hat{s}', \hat{d}\hat{z},$
4 mm	m', m''		$\hat{d}\hat{z}', \hat{d}\hat{z}, \hat{t}\hat{f},$
5 mm	n, n''		$\hat{t}\hat{f}', t\hat{\varphi}$
6 mm	η'	2 mm	m_{\circ}
7 mm	n_{\circ}	3 mm	$t\hat{s}$
8 mm	η	4 mm	m, m''
9 mm	n'	5 mm	m', n'_{\circ}
		6 mm	n''
		7 mm	n, η'
		8 mm	η
		11 mm	n, n'_{\circ}

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